THE IRON AGE

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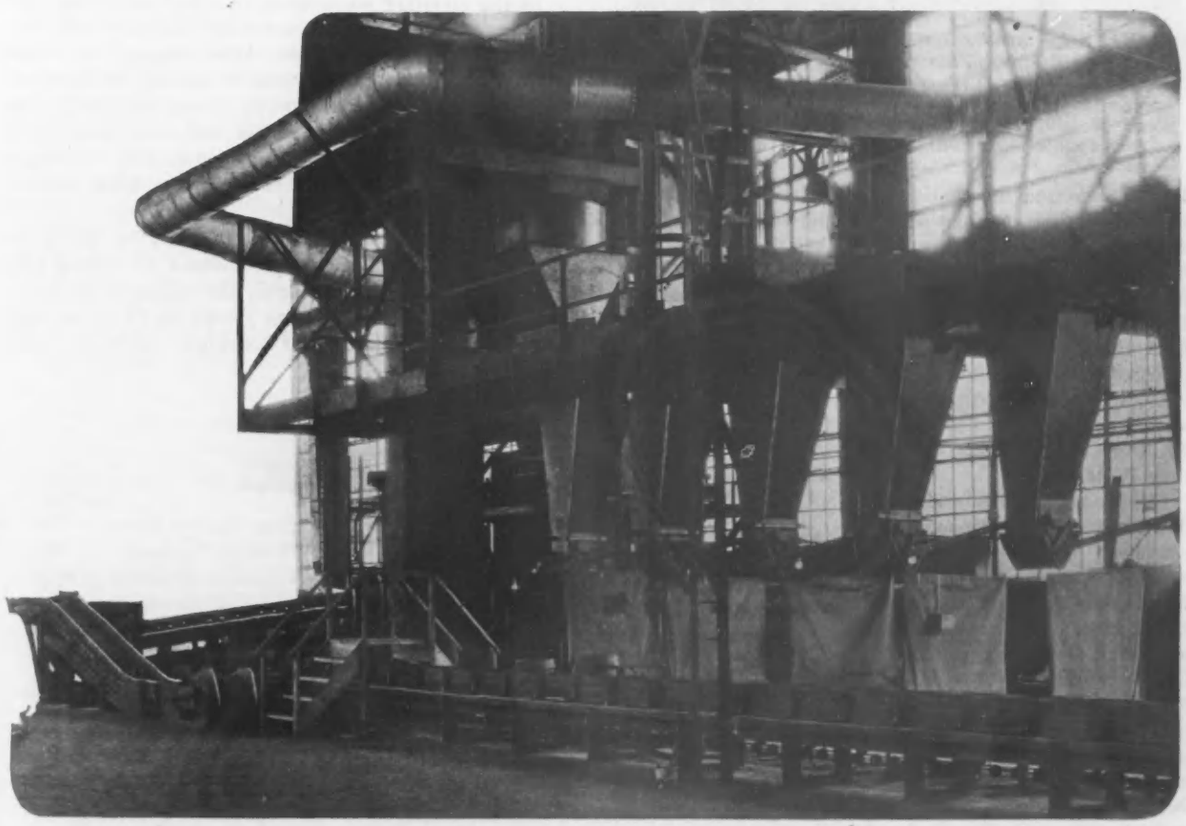
Continuous Casting of Small Parts

Production of Nearly 10,000 Castings for Small Electrical Motors Attained With Minimum of Labor, Reusing Sand Each Hour

A CONTINUOUS unit for the manufacture of small gray iron castings was placed in operation recently by the Elmira Foundry Co., Elmira, N. Y. A complete sand handling and sand preparation system is included.

This unit is an interesting adaptation of a foundry to a special class of production work and was provided to make possible a large output in a small floor space and to solve the problem of handling an unusually large amount of molding sand in comparison with the tonnage of castings produced. The castings are for end bells for fractional horsepower induction motors used largely for refrigerators and washing machines and have thin sections, averaging $\frac{1}{4}$ in. in thickness and 3 lb. in weight. Were the molds set on the floor and poured once a day an enormous amount of sand would be required in making them. The continuous unit installed has a capacity of 9600 castings per day of 8 hr. requiring approximately 22 tons of metal. By minor additions this can be doubled. While the production of castings is large in number, the tonnage is small because of the small size of the castings.

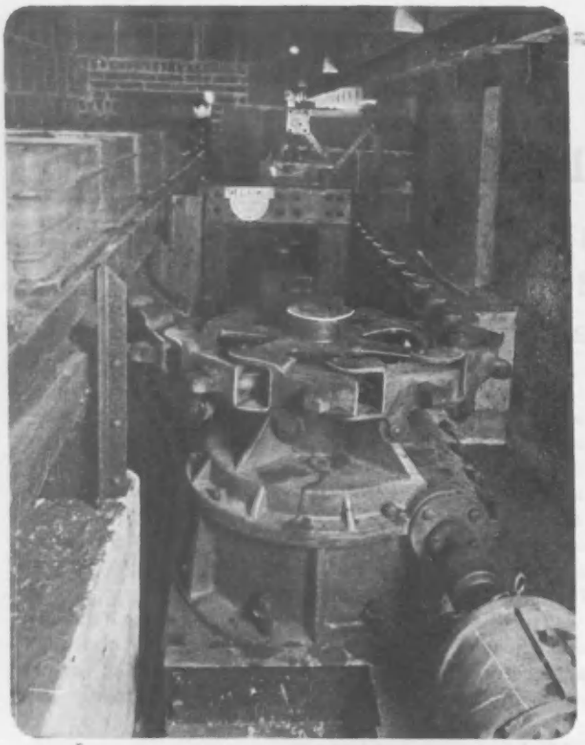
The Elmira plant includes three separate foundries and the work is divided according to size and character of the castings. Plant No. 1, used for turbine work, produces castings weighing 2 to 22 tons. This



MOLDS made in machines placed between canvas partitions pass around conveyor, moving toward right. After passing through pouring room they return to point just beyond safety bridge, where the flasks are shaken out and hot castings return in opposite direction on pay conveyor. Shake-out sand and spill sand is returned by underfloor belts to elevators and conditioning plant in center of view, and tempered sand returned to 1-ton hoppers over each molding machine

is served by a 35-ton Whiting cupola which is tapped once a day. Here all the molding is sweep work. Medium and heavy castings weighing 500 lbs. to 3 tons are made in plant No. 2. This has a capacity of 60 to 80 tons per day. This unit is provided with two Herman jolt roll-over pattern drawing molding machines for part of the molds, the remainder being hand made.

The No. 3 foundry, in which continuous molding and pouring is done, takes care of the lighter castings of from 3 to 500 lb. This building is 560 ft. long and



THE drive of the mold conveyor is of a special unique design. This is a caterpillar type chain drive. The chain is placed in a vertical instead of a horizontal plane with the drive from the side instead of beneath. With this drive the necessity of a double-jointed driving chain is avoided

120 ft. wide and the continuous molding unit for making the smaller castings occupies one side. In the remaining space molds are poured on the floor. The foundry is served by two Whiting cupolas of the continuous type located in a cupola and pouring room at the side of the foundry. The cupolas are operated one at a time, on alternate days. They are mechanically charged by a 3-ton hoist equipped with a special charging attachment supplied by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Molds are handled and poured on a Stearns continuous mold conveyor of the endless chain type, 430 ft. long and oval in form. This conveyor moves at a speed of 22½ ft. per min. Molds are made on a battery of twenty Osborn jolt roll-over molding machines arranged in one line at the side of and parallel with the mold conveyor, spaced 6 ft. apart, alternate ones working on cope and drag. Steel flasks and metal patterns are used. The flasks are 12 in. x 18 in. x 12 in. deep. For castings 6 in. and smaller in diameter two molds are made in one flask, but molds for larger castings up to 11 in. in diameter are made one in a flask. When the mold is completed the molder places it on the conveyor and clamping weights are set on the top of the flasks while they are moving along the conveyor at the far end, just before entering the pouring room.

The cupola is tapped into a bull ladle supported on trunnions and from this the metal is dumped into 150-lb. hand ladles suspended from a trolley on which it is run to the pouring zone. A feature not commonly found in conveying equipment for continuous molding and pouring systems, is a pouring conveyor 28 ft. long, which runs at the same speed as the mold conveyor and on which the men stand while pouring the molds.

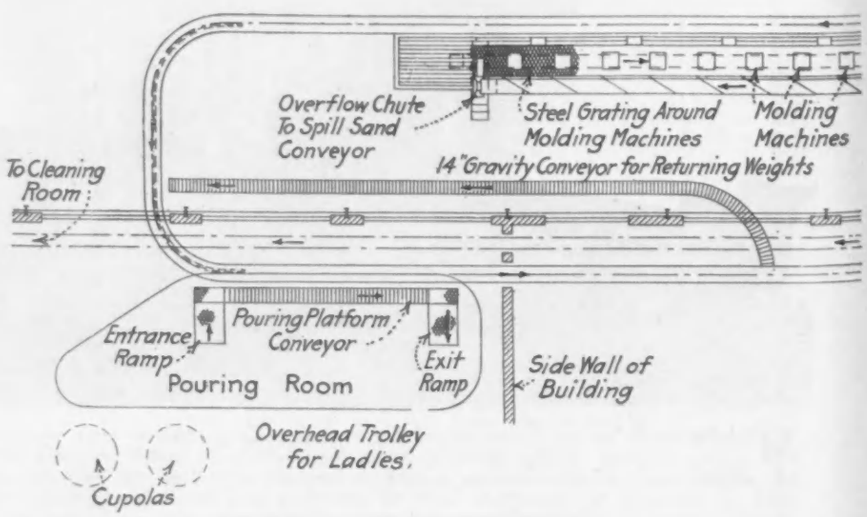
The mold conveyor passes from the pouring room into the open air, running along the outside wall of the foundry, and then turning back into the building. With this arrangement the fumes are to a considerable extent discharged into the open air. A man stationed at a point a short distance from where the molds are poured removes the weights and places them on a roller gravity conveyor, on which they are carried back to the point where they are placed on the flasks. This conveyor is the only gravity conveyor used in the system.

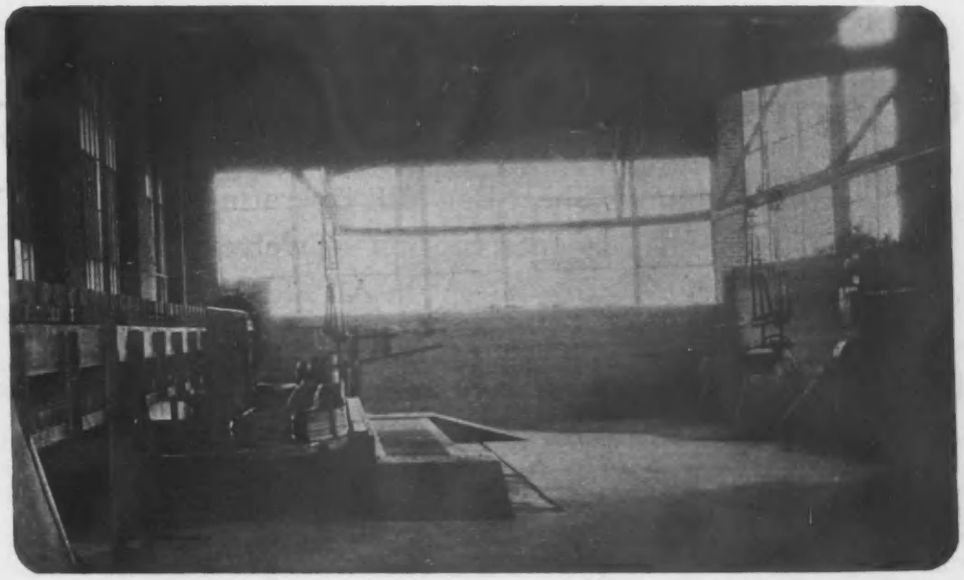
When the flasks in their circuit reach a point about 10 ft. from the first molding machine they are tilted end for end on the conveyor and dumped on a vibrating knockout. The empty flasks are placed back on the mold conveyor and again travel past the molding machines. Here the molders remove them from the conveyor and set them on tables at one side until needed.

The castings are raked off the knockout table to a hot castings conveyor of the apron type that carries them, in the opposite direction from which the flask came, back through the pouring room into the cleaning room. This conveyor is 300 ft. long, 200 ft. of which is in the open air. It moves at a speed of 24½ ft. per min. By the time the castings have reached the end of the conveyor they have cooled sufficiently to be handled by hand.

In the cleaning room there is a battery of six Sly tumbling mills for the conveyor output and the necessary grinding machines. After cleaning, the work moves to inspection tables and if passed the castings are loaded on cars for shipment. From each day's run castings are taken for hardness test and these must show a Brinell hardness of from 142 to 175. Castings are handled in the cleaning room in tote boxes hauled by an electric lift truck.

The Stearns mold conveyor differs in design from other conveyors of this type. Instead of having the usual cast iron mold carriages, the conveyor is made up of 24-in. x 24-in. steel cars spaced on 27-in. centers and mounted on Hyatt roller bearings. Only one flask





THE pouring room. The upper conveyor is the discharge end of the hot castings conveyor to the cleaning room. The pouring zone section of the mold conveyor comes in underneath. At the right of the mold conveyor and moving at the same speed is a conveyor 28 ft. long on which the men stand while pouring. Ladles of metal are handled from bull ladles at the cupola, suspended on hoists from the monorail

is placed on a carriage at present, but two flasks can be put on each carriage, thus doubling the capacity to 19,200 castings per 8-hr. day. The conveyor chain is hung in a vertical instead of a horizontal plane and a special caterpillar chain drive is from the side instead of beneath. The advantage of this arrangement, it is pointed out, is that it avoids the necessity of having a double jointed chain which would be required for a conveyor making a complete cycle, were the driving chain placed in a horizontal position.

The drive is through a planetary type of speed reducer connected directly to the motor and a vertical worm gear speed reducer connected directly to the planetary reducer. All other power-driven units have independent motors and speed reducers. The latter were supplied by the W. A. Jones Foundry & Machine Co., Chicago.

Unusual care is taken in the preparation of molding sand to insure the conditioning and tempering required to produce high-grade castings having a very smooth finish. Sand knocked out from the molds is discharged through the shakeout table on to a knockout sand conveyor which delivers it to an elevator. To this elevator is also delivered sand struck off or spilled during the molding operations. (The molding machines are set above grating-covered hoppers into which the spilled sand passes, eliminating the shoveling of the sand from the floor by the molders.) From this elevator the knockout and spilled sand is discharged over a vibrating screen supplied by the Pittsburgh Coal Washer Co., to separate the sprues and other metallic substances, which are discharged into boxes. The sand going through the screen is deposited into a 60-ton bin beneath the screen and from the bin it is fed by an apron conveyor on a belt conveyor with a magnetic head pulley to catch any metal that may have passed through the screen.

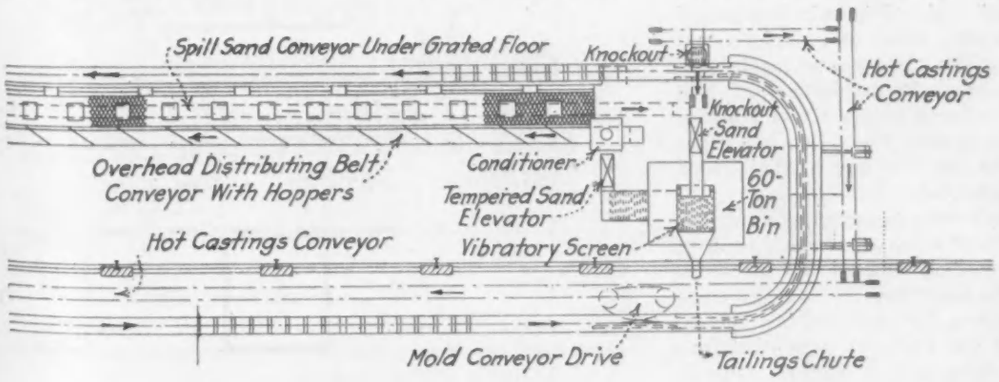
From this conveyor the sand is discharged into a double paddle pug mill, in which it is conditioned and tempered. Water is added through a spray regulated by the man who operates the conveyor for tempered sand. The pug mill consists of two parallel shafts with cast steel paddles arranged in a spiral form. The tips of the paddles are of white iron to withstand wear, and are removable so that new paddles can be substituted when required. The pug mill is provided with S.K.F. thrust bearings.

Sand passes from the pug mill into an elevator that discharges it into a sand conditioner of a special type, the function of which is to fluff up the sand. It consists of a vertical shaft on the lower end of which is a wrought iron spider. The sand is beaten up by the rapid whirling motion of the spider through which it passes. The spider revolves at a speed of 720 r.p.m.

Leaving this conditioner the sand is discharged through a hopper on a distributing sand belt from which it is plowed off into 1-ton hoppers above each molding machine. If there is excess sand on the distributing belt it is carried over the head pulley and discharged into the spilled sand belt.

Extreme care is taken to keep the proper amount of moisture in the sand. Each hopper of sand is tested for moisture content by means of a moisture meter supplied by the R. W. McIlvaine Co., Chicago, and the amount of moisture is recorded. This testing is done by the man operating the distributing plows.

The sand handling system has a capacity of 60 tons an hour and the sand makes a circuit of the system in an hour, being used over again eight times per day. Core making is a minor problem, as few of the castings require cores.



PLAN of continuous unit in gray-iron foundry of Elmira Foundry Co. Total elimination of hand shoveling, and complete circulation of sand at hourly intervals are effected by this self-contained unit

Changing Mills with Minimum Delay

Continuous Sheet Bar Mill Operating After Only 12-Day Interruption—Twelve Stands in All

CAREFUL preparation of an operating schedule and a construction program enabled the Inland Steel Co. to switch from an existing 24-in. three-high mill to a new 19-in. continuous sheet bar mill with an interruption in production of only 12 days. The new continuous mill, erected at plant No. 1, Indiana Harbor, Ind., is capable of rolling squares ranging from 1½-in. up to 4-in. and sheet bars in widths from 8 in. to 12 in. and weighing from 6½ to 54 lb. per ft.

Previous to the erection of the new mill, billets and sheet bars were rolled on a 24-in. three-high mill served by a 36-in. blooming mill. Several years ago, in anticipation of the new mill, a new hotbed, bar piler and flying shear were installed in a location so as to serve the existing mill and also fit into the future scheme when it materialized. In the rearrangement, one stand of the present 24-in. three-high mill, with its lifting tables and manipulators, was retained for use as an independent billet mill for sizes beyond the capacity of the new continuous mill.

This stand of rolls is located in line with the run-out from the 36-in. bloomer and about 320 ft. from the center line of that mill. The necessary tables and equipment were retained to provide shearing and piling facilities for the billet mill output. A transfer, capable of handling blooms up to 100 ft. long, takes material from the 36-in. bloomer run-out table and transfers it to the run-in table which serves the new continuous sheet bar and billet mill.

Twelve Stands of Rolls in New Mill

The new mill consists of two stands of 24-in. rolls, six stands of 19-in. rolls and four sets of vertical edging rolls located respectively before the first, third, fifth and seventh horizontal stands. Immediately in front of the mill is an up-and-down cut shear having a capacity of 35 sq. in., followed by a set of 18-in. vertical edging rolls, then the two stands of 24-in. rolls. All of these units are driven by one 3000-hp. variable-speed motor.

With a space of 24 ft. from the last stand of the 24-in. mill the first stand of the 19-in. mill is preceded by a set of 16-in. edging rolls driven by an independent adjustable-speed motor. The third edger, located between stands 4 and 5, is driven by the mill motor. The fourth edger is located between stands 6 and 7 and is driven by an independent motor. The six stands of the 19-in. mill are driven by one 7500-hp. constant-speed motor through a Falk gear reducer.

Rolls for the 24-in. mill were designed as nearly as practicable for a permanent setup and have passes in a single set of rolls to cover all sections that the 19-in. mill is capable of producing. The 19-in. mill is arranged with looping devices between the roll stands. All roll housings are of the open top type, with the bottom rolls adjustable by means of wedges actuated by screws from the front of the mill.

Driving Motors and Controls

The 24-in. mill is driven by an adjustable-speed Scherbius set through a Falk reducing gear unit. The motor has a maximum speed of 500 r.p.m. and a minimum speed of 250 r.p.m. The Scherbius set consists of one 3000 to 1500-hp., 500 to 250 r.p.m., 2200-volt, 3-phase, 25-cycle, wound-rotor motor and one Scherbius regulating set consisting of one 650-kva., 375 r.p.m., 190-volt generator, direct connected to an induction motor rated at 900 hp., 375 r.p.m., 2200 volts, 3 phase, 25 cycles, with the necessary controlling and regulating equipment.

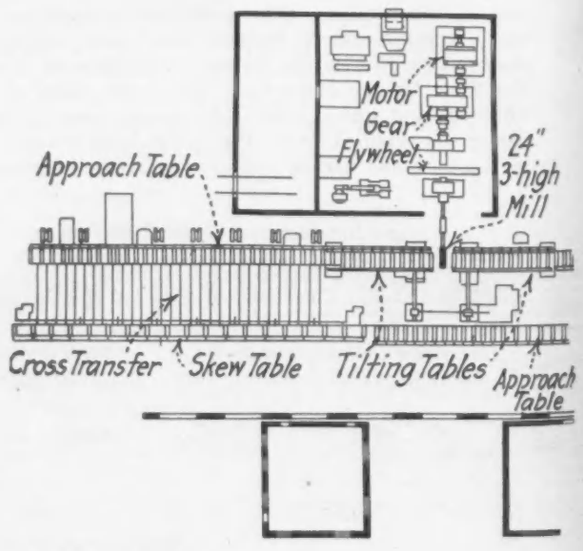
The 19-in. mill is driven by a constant-speed Westinghouse motor through a reducing gear unit having a motor speed of 365 r.p.m. This induction type motor is rated at 7500 hp., 375 r.p.m., 2200 volts, 3 phase, 25 cycles.

Both motors and all other electric drive accessories have been placed in a motor room, 220 ft. long by 36 ft. wide, immediately adjoining the mill. The switchboard is located in the middle of the building on the floor level. On the balcony immediately above are the bus structure, switches and high-tension equipment. The master controls are in front of the primary panels so that the operator can see all instruments while handling the drive. The motors can be regulated as to speed and stopped from the mill control pulpit, but starting can be effected only by the operator in charge of the motor room.

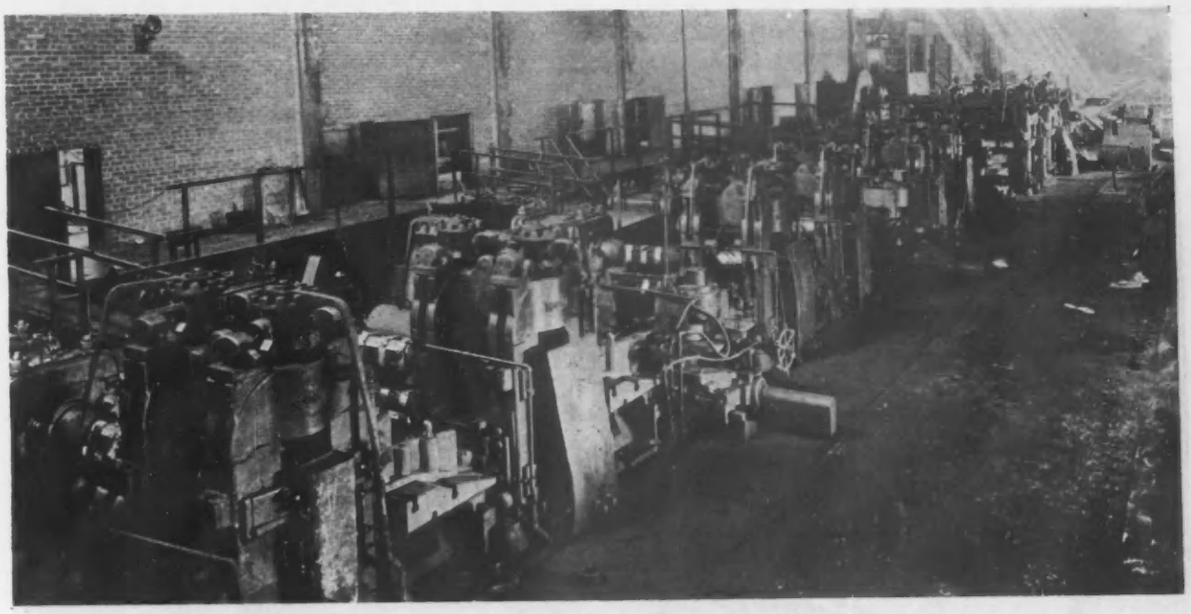
Planning to Avoid Interference

Construction work was proceeded with in two sections: That which could be undertaken without interference with the existing mill, and that portion which would interfere with the existing mill and which, therefore, had to be performed in the minimum of time.

After the motor room with all its equipment was first constructed, the concrete work for foundations up



One Stand of the Existing 24-in. Three-High Mill Was Retained (Above, at left). Production was interrupted only 12 days when changing from the old to the new mill



Delivery End (above) of the New Continuous Sheet Bar and Billet Mill. Edging rolls are seen before No. 7 stand (No. 8 is at extreme left) and before Nos. 5 and 3 stands (No. 3 is the first of the 19-in. train)

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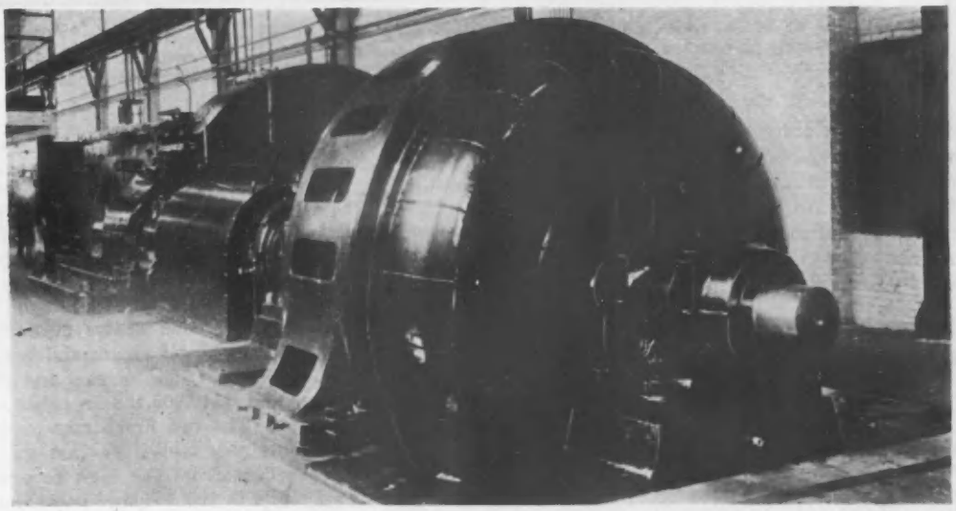
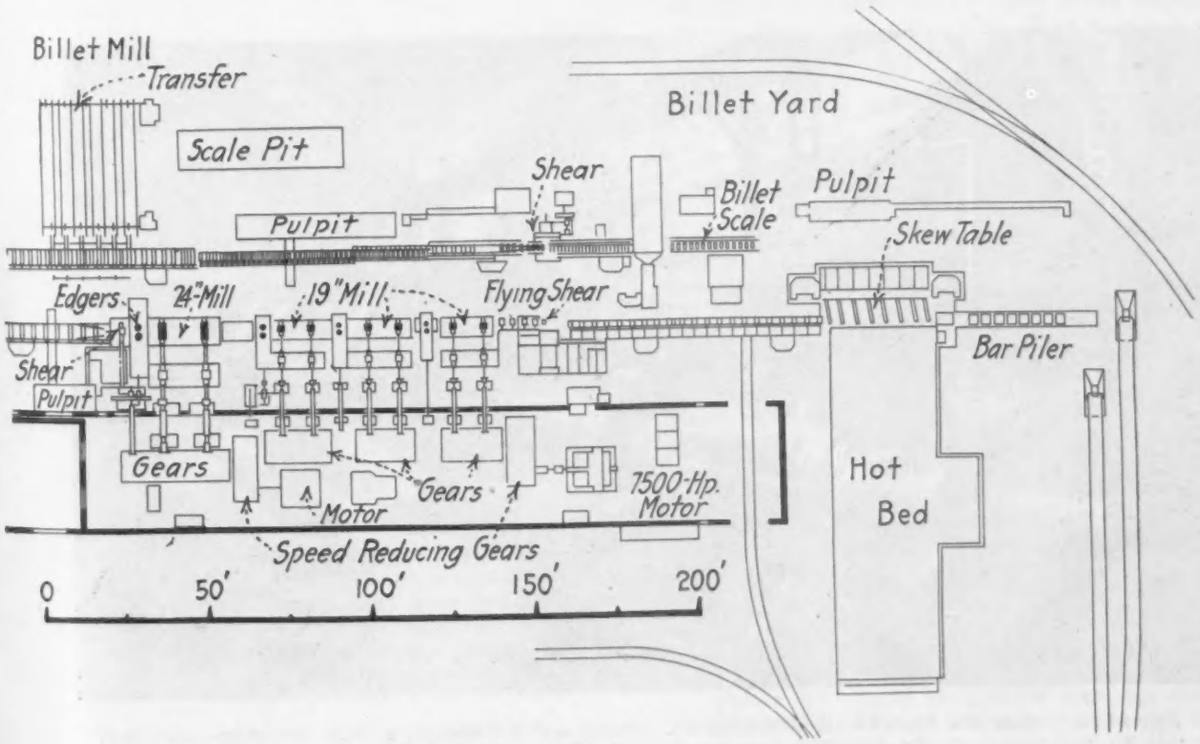
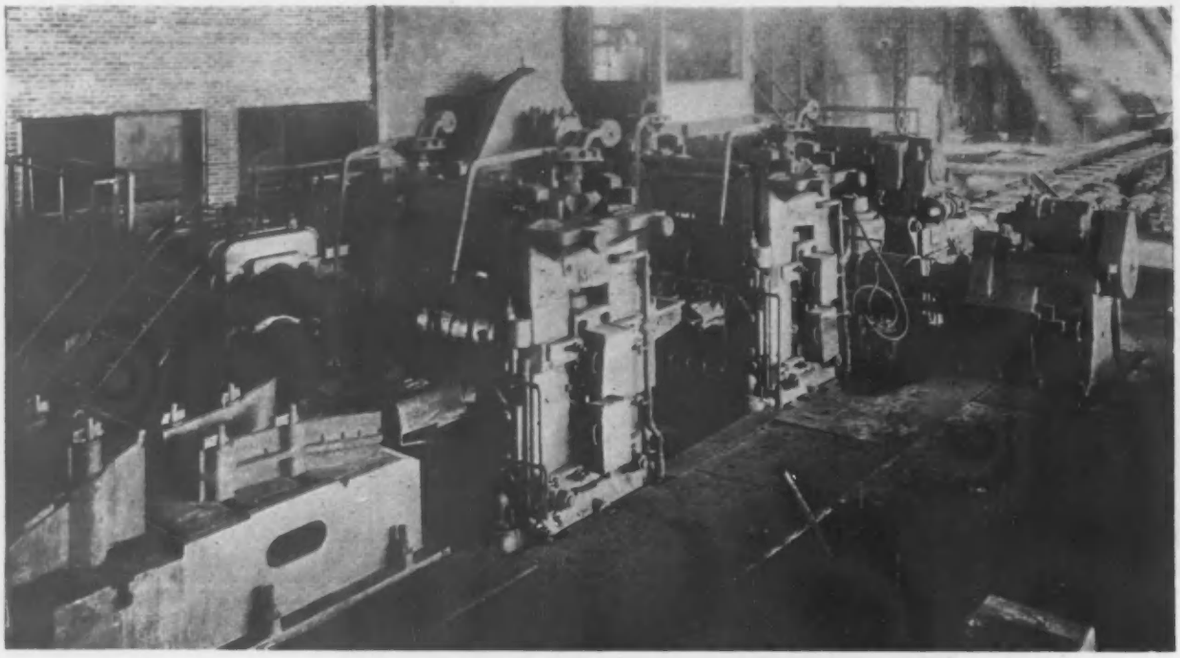
Constant-Speed Induction Motor Rated at 7500 Hp., (Right) Driving the 19-In. Mill. The speed-reducing gear is beyond the motor







Two Stands of 24-In. Rolls (Above) Are Followed by Six Stands of 19-In. Rolls. The steel moves toward the left, passing through a shear and a pair of edging rolls before entering the first 24-in. stand and through another pair of edging rolls ahead of the first 19-in. stand

to the pinion stands was placed. A careful schedule was next prepared showing every operation in connection with dismantling the existing mill, installing the 100-ft. transfer, remodeling and re-erecting existing tables and installing the mill proper. The old mill was shut down on Friday, Feb. 5, and the first bar was rolled on the new mill on Thursday, Feb. 17.

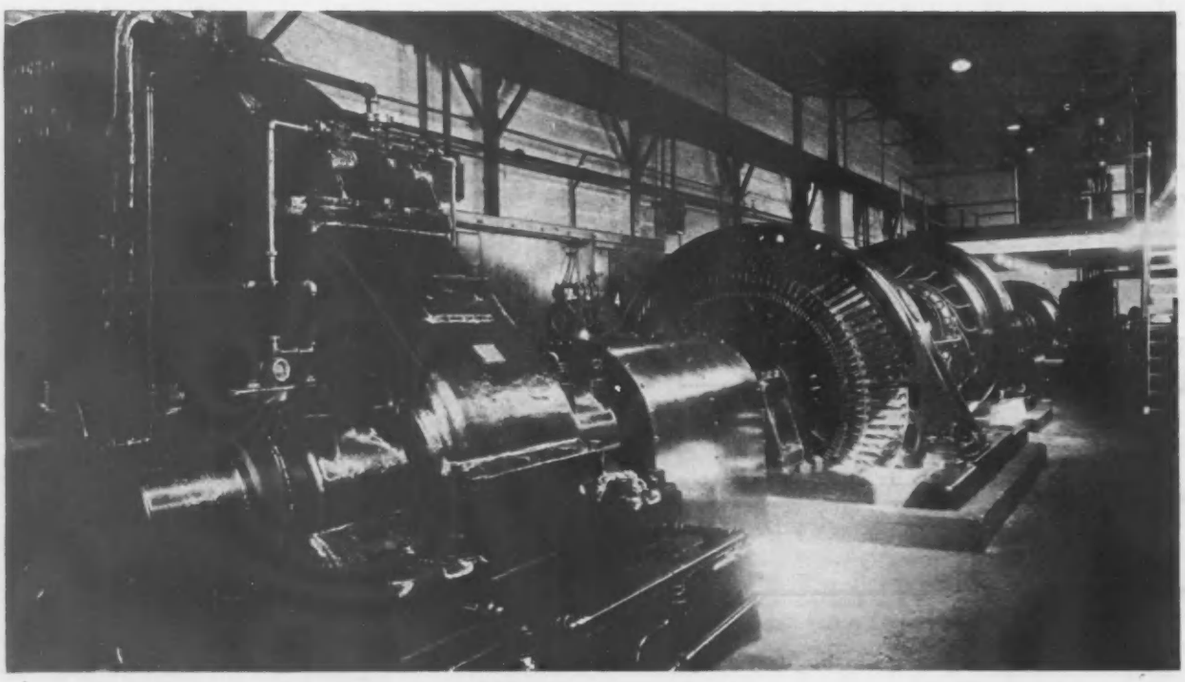
Manufacture of Domestic Heating Apparatus and Steam Fittings

Stoves and warm air furnaces, gas and oil stoves and appliances, and steam fittings, including steam and hot-water heating apparatus, are covered in a report on manufactures in 1925, issued by the Census Bureau. Copies may be obtained at 5c. from the Superintendent of Documents, Government Printing Office, Washington.

There were 789 establishments engaged in this line of manufacture in 1925, compared with 824 in 1923. The wage earners were 89,774, with total wages amount-to $130,278,639 during the year. The value of products is given as $493,232,937, of which amount $320,003,253 represents value added by manufacture. Both the latter item and the value of products are the largest ever recorded for these industries.

The subdivision shows $228,929,985 of products in steam fittings, and steam and hot-water heating apparatus; $123,497,794 in gas and oil stoves and appliances, and $140,805,158 in other stoves and warm-air furnaces. The two first items made the largest records ever obtained, while the last item showed a drop of 9.6 per cent from the high record made in 1923.

Details in the 15-page pamphlet show operations by States and many particulars relating to the manufacturing.



The Two 24-In. Stands Are Driven by a 3000-1500 Hp. Scherbius Set Through a Falk Reducing-Gear Unit, the Latter Appearing at Left (Inland Steel Co.)

Possibilities of Fuel Economy

Limitations Imposed by Character of Steel Mill Equipment and of Product—Calculations for Specific Cases Presented

BY E. F. ENTWISLE

THIS is a discussion of a paper which, under the above title, was presented by H. A. Brassert, consulting engineer, Chicago, before the Eastern States Blast Furnace and Coke Oven Association at the winter meeting held at Pittsburgh, March 4. Mr. Entwisle, who is assistant general manager Steelton plant, Bethlehem Steel Co., prefaced his remarks with a statement that Mr. Brassert's treatment had covered the matter so completely as to preclude great detail in many of his points. "It is obviously just as impossible for me, in discussing his paper, to attempt to analyze it in detail. It seems to be proper, however, to emphasize, by means of some specific data, the fact that such economies as are possible, are possible only when the coke ovens and blast furnaces are so operated as to give the maximum of excess gas for subsequent steel plant operations."

CONDENSED into a single sentence, Mr. Brassert's conclusions are that the ultimate in fuel economy (aside from the question of financial economy) is to produce the maximum tonnage of finished steel products with the purchase of the minimum quantity of fuel for carbonizing or for heating, and, where any surplus of waste gases or heat remains, to convert such surplus into the maximum amount of power for sale to outside consumers.

At least two points must be taken into consideration in applying such a yard-stick of economy to any individual plant: (1)—The make-up of the plant itself, what its products are, to what extent these products are finished, the method of steel making, proximity of the coke ovens to the blast furnaces, and other similar considerations and (2)—The practical economic consideration, or, as I called it above, the financial economy.

In other words, can a plant, in view of conditions for any location as to equipment already installed and as to fuel prices and their probable fluctuation during the life of the equipment, afford to spend the money required for equipment necessary to obtain the ultimate in fuel economy? Or would the lowest operating cost be obtained by purchasing the additional fuel required by a lesser heat economy?

Specific Analysis of Two Conditions

Each plant is a problem in itself, but there are certain basic facts that apply in every case. Before it is possible to determine the procedure in any case, a study must be made of the situation along the lines of the following figures. I have taken for analysis and comparison two rather different conditions.

First is a plant in which 100 per cent of the steel is made by the Bessemer process, and probably somewhat representative of the German plants to which Mr. Brassert refers as having already established themselves on a heat recovery basis where the only coal required in the entire steel plant operation is for carbonizing. Second is a plant more nearly representative of average American conditions, in which I have assumed 20 per cent of the ingot production by the Bessemer process and 80 per cent by the open-hearth process.

Figures in the tables show approximately the surplus heat production from the coke ovens and blast furnaces for both of the conditions outlined above, and also the total amounts of heat necessary to carry on the various operations of steel making, heating and rolling. I have assumed in both cases that the ingots are rolled into blooms, the blooms reheated and rolled into billets and the billets reheated and rolled into commercial bars. If any of these operations can be omitted, there will be a corresponding surplus in the amount of heat available. If additional operations are required beyond those stated, additional amounts of heat will be necessary.

Basis of Discussion

I have assumed that in the Bessemer process 1.25 tons of iron are required per ton of ingots produced, and that in the open-hearth operation 0.60 ton of iron is required per ton of ingots. It is obvious, therefore, that, in a plant making all of its steel by the Bessemer process, considerably more iron will be required per ton of ingots produced and that, to produce a greater quantity of iron, additional coke will have to be produced. Hence the surplus gases from the coke oven and blast furnace operations will be substantially higher per ton of ingots produced in the 100 per cent Bessemer plant than in the 80 per cent open-hearth plant.

Mr. Brassert's figure of 13,160,000 B.t.u. has been taken as the heat in the blast furnace gas per ton of iron produced. The heat required to produce a ton of open-hearth ingots is taken at 4,000,000 B.t.u. The complete figures for these two conditions are tabulated.

Operation on the 80 per cent open-hearth basis will result in 40 boiler hp. hr. recovery for each ton of open-hearth ingots produced. This works out into a recovery of 1,070,000 B.t.u. for each ton of ingots produced, as in Table II.

In addition to the amounts of surplus heat available (Table II) there are further possibilities through the dry quenching of coke. From the present status of this development there are thus available in the 100 per cent Bessemer plant 904,000 B.t.u. per ton of ingots produced; in the case of the 80 per cent open-hearth plant, 535,000 B.t.u. per ton of ingots produced.

From Table III it appears that the heat required, for heating only, would be 3,200,000 B.t.u. per ton of ingots produced, whether operation be 100 per cent Bessemer or 20 per cent Bessemer and 80 per cent

open-hearth, provided the blooms are charged hot. If they are charged cold, heating would require 4,700,000 B.t.u. for either case.

Rolling of the ingots, also, would be independent of the steel-making operation. Power is figured at 110 kwhr. to convert each ton of ingots to commercial bars on motor-driven mills. On the basis of 20 per cent thermal efficiency at the switchboard of the power plant, this represents the requirement of 1,870,000 B.t.u. for rolling each ton of ingots produced.

Consequently the total heat requirements for producing steel and for heating and rolling, per ton of ingots produced, would be 5,570,000 B.t.u. for 100 per cent Bessemer operation with blooms charged hot and 7,070,000 B.t.u. for blooms charging cold. Similarly, with 80 per cent open-hearth and 20 per cent Bessemer operation, the requirements would be 8,370,000 B.t.u. for hot charging of blooms and 9,870,000 B.t.u. for cold charging.

Surplus Heat Available

Comparison of the total surplus heat available with the total heat required to carry on the operations shows that, in the case of the 100 per cent Bessemer operation, there is a large surplus of heat beyond the amount required for producing the steel and for heating and rolling. This surplus, available for sale outside of the plant, consists of the coke oven gas not needed for oven heating and all of the tar and breeze, unless some subsequent operation is carried on, beyond the assumed production of commercial bars only from all of the ingots produced.

In the case of the 80 per cent open-hearth operation, however, the balance is very much closer. It is unlikely, due to the fact that the steel production, heating and rolling proceed at a different rate from the production of coke and pig iron, that all of the steel production, heating and rolling requirements can be completely taken care of by the combined heat surplus. For the open-hearth requirements, however, the heat in the tar, which can be readily stored and used as required, constitutes an easy means of synchronizing the open-hearth demands with the coke oven production. If there is no outside market for surplus coke oven gas and tar, the open-hearth operation can just about be carried from the coke ovens.

Our figure of 4,000,000 B.t.u. per ton of open-hearth ingots is below average present practice in this country. But it is a figure that is being reached in some plants and, with proper facilities and control, can be met regularly. If there is a market outside of the plant for the coke oven gas and tar, either producer gas, coal or oil can be substituted at the open-hearth for the fuel requirements. Or the coke ovens can be operated with gas producers or with the surplus blast furnace gas, in which case the coke oven gas thus released will take care of approximately 60 per cent of the open-hearth fuel requirements.

Exact Balance Difficult to Attain

A surplus of blast furnace gas is shown as being sufficient to carry on all of the heating of the steel for normal rolling, from ingots to commercial bars. In the case of the plant where the blast furnaces are blown by gas engines, there is sufficient surplus gas and open-hearth waste heat steam to carry on both the heating and the rolling requirements. The difference between the irregular occurrence of the power and heating demands of the steel plant, however, as compared with the even rate of production at the coke ovens and blast furnaces as previously referred to, makes it unlikely that this balance can be exactly met.

But, by eliminating the power requirement, substantially all of the heating requirements, which fluctuate somewhat less than the power demands, can be supplied from the surplus blast furnace gas. Some gas producer capacity or fuel oil would probably be required, to compensate for such differences as might develop between the rates of operation of the blast furnaces and rolling mills.

Power for the requirements of the plant can be supplied by using a portion of the surplus blast fur-

Table I—Heat Surplus from Blast Furnaces and Coke Ovens

	100 Per Cent Bessemer	80 Per Cent Open-Hearth and 20 Per Cent Bessemer
Blast Furnaces		
Iron per ton of ingots, tons	1.25	0.73
B.t.u. per ton of iron	13,160,000	13,160,000
Gas consumed by stoves, per cent	25	25
Gas consumed in blowing, if gas-engine driven, per cent	15	15
Gas consumed in blowing, if turbo-blown, per cent	25	25
Surplus gas per ton of iron produced, if gas blown, per cent	60	60
Surplus gas per ton of iron produced, if turbo-blown, per cent	50	50
Total heat in surplus gas per ton of iron produced, of gas blown, B.t.u.	7,900,000	7,900,000
Total heat in surplus gas per ton of iron produced, if gas blown, B.t.u.	6,580,000	6,580,000
Surplus heat in blast furnace gas per ton of ingots produced, if gas blown	9,900,000	5,750,000
Surplus heat in blast furnace gas per ton of ingots produced, if turbo-blown	8,250,000	4,800,000
Coke Ovens		
Tons of coal per ton of coke produced	1.33	1.33
Cu. ft. surplus gas per ton of coal carbonized	7,000	7,000
Assumed fuel ratio at blast furnaces	0.90	0.90
Cu. ft. surplus coke oven gas per ton of iron produced	8,400	8,400
Net B.t.u. of coke oven gas	475	475
Net B.t.u. in surplus coke oven gas per ton of iron produced	4,000,000	4,000,000
Net B.t.u. in surplus coke oven gas per ton of ingots produced	5,000,000	2,900,000
Gallons of tar per ton of coal carbonized	9	9
Gallons of tar per ton of iron produced	10.8	10.8
Gallons of tar per ton of ingots produced	13.5	7.8
Total B.t.u. in tar per ton of ingots produced	2,080,000	1,200,000
Breeze and domestic coke, in percentage of coal carbonized	4.0	4.0
B.t.u. from breeze and domestic coke, per ton of ingots productd.	1,608,000	940,000

Table II—Total Surplus Heat

	100 Per Cent Bessemer		80 Per Cent Open-Hearth and 20 Per Cent Bessemer	
	Gas Blowing	Turbo-Blowing	Gas Blowing	Turbo-Blowing
Blast furnace gas	9,900,000	8,250,000	5,750,000	4,800,000
Coke oven gas	5,000,000	5,000,000	2,900,000	2,900,000
Tar	2,080,000	2,080,000	1,200,000	1,200,000
Breeze and domestic coke	1,608,000	1,608,000	940,000	940,000
Open-hearth waste heat	.....	.....	1,070,000	1,070,000
Total	18,588,000	16,938,000	11,860,000	10,910,000

Table III—Heating Requirements per Ton of Ingots

	100 Per Cent Bessemer	80 Per Cent Open-Hearth and 20 Per Cent Bessemer
B.t.u. required per ton of ingots produced	.....	3,200,000
Bessemer blowing B.t.u.	500,000	100,000
Heating ingots B.t.u.	1,000,000	1,000,000
Heating blooms (hot) B.t.u.	1,000,000	1,000,000
Heating blooms (cold) B.t.u.	2,500,000	2,500,000
Heating billets B.t.u.	1,200,000	1,200,000
Total B.t.u. for producing steel and heating*	3,700,000 or 5,200,000	6,500,000 or 8,000,000

*The lesser figure is the requirement if blooms are charged in heating furnaces when hot after blooming; the greater figure is for a condition where blooms are reheated after becoming cold.

nace gas in gas engines and supplying the resulting deficiency in heating by either producer gas, coal or oil, or

A portion of the blast furnace gas can be burned under boilers and power generated in engines or turbines, and the resulting deficiency in heating taken care of by either producer gas, coal or oil, or

The entire power load can be carried on a steam station fired with the cheapest grades of fuel available and driving either engines or turbines, or

The power may be purchased from an outside source, leaving all of the surplus gas available for carrying on the heating operations.

Each Case Is a Separate Study

It must be realized, of course, that the figures that I have given constitute only an approximate heat balance. It is substantially correct for a given set of conditions, but many variables, such as the quality of the coals used, the relative percentage of the total ingot tonnage made by the Bessemer or the open-hearth process, the degree to which finishing operations are carried on, etc., will vary the figures considerably from those given.

For each particular case, a balance along the general lines indicated should be set up. From it can be determined, taking into account fuel and labor costs and existing equipment, just what combination is the most economical for that particular set of conditions. In no case, however, can either the coke ovens or blast furnaces, without penalty to the subsequent operations in the steel plant, afford to use more than the absolute minimum of their gas for their own operations.

Tapered Steel Plates for Construction Work

Suggested Use of a New Form of Structural Steel—Considered for an Oil Storage Tank

SHELLS of large steel tanks for storage of oil are made of five or six horizontal rings of narrow plates, each of uniform thickness. The dimensions of these plates have not changed materially since they were governed by manufacturing limitations of iron plates two generations ago. But these shells, according to a Pittsburgh consulting engineer, could be constructed of upright taper-rolled plates, shipped from the mills to the tank site and there welded in final position with vertical seams. This would save about 20 per cent in total weight of steel used, and all of the costly field riveting and calking. The accompanying sketches and tables were obtained from the engineer.

TABLE II—STANDARD TAPERS SUGGESTED

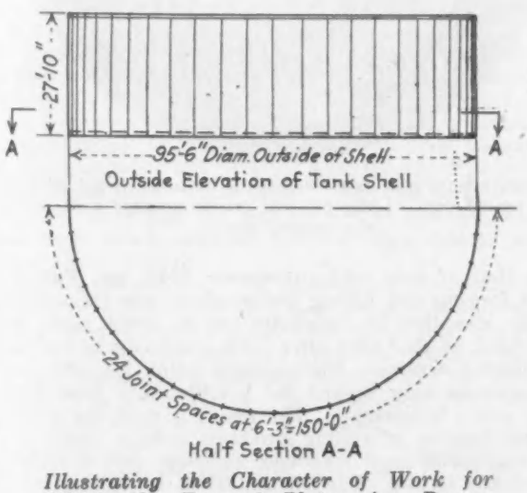
Designation of Rate of Taper	Rate of Reduction in Thickness: Fractional	Rate of Reduction in Thickness: Decimal
No. 00	1 in 1667	0.0006
No. 0	1 in 1250	0.0008
No. 1	1 in 1000	0.001
No. 2	2 in 1000	0.002
No. 3	3 in 1000	0.003
No. 4	4 in 1000	0.004
No. 5	5 in 1000	0.005
No. 6	6 in 1000	0.006
No. 7	7 in 1000	0.007
No. 8	8 in 1000	0.008
No. 9	9 in 1000	0.009
No. 10	10 in 1000	0.010

TABLE I—TAPER PLATE STEEL OIL TANKS

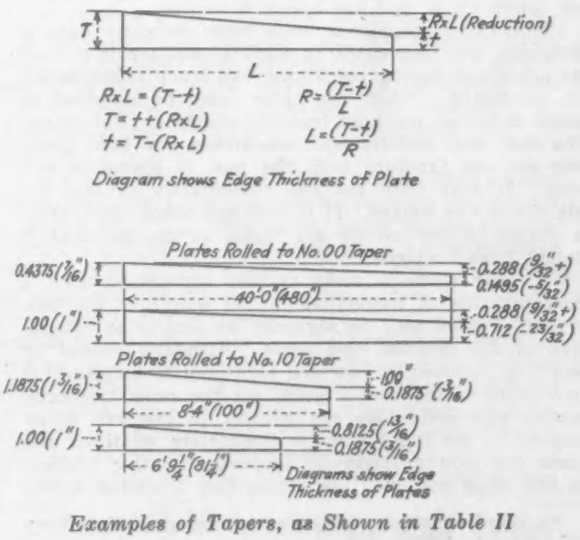
Comparison of main characteristics of 35,000-bbl. tanks:—Six-ring standard tank and taper plate tank, both riveted and welded.

Items Compared	Riveted Tank: Standard	Riveted Tank: Taper Plate	Saved by Use of Taper Plate, Per Cent	Welded Tank Taper Plate
Number of pieces in shell.....	Plates 120 Angles 50	40 40	66 50	48 24
			Average 58	
Weight of shell (without rivets)	122,000 lb.	120,000 lb.	2	92,370 lb. (a)
Field-driven rivets in shell.....	¾ in.— 4,800 ⅞ in.— 5,700 1 in.— 7,000	4,600 4,400 6,600	3½ 23 5	None
	Total—17,500	15,600	Average 10½	
Total lin. ft. of calking.....	5,300	3,500	34	

(a) 95,315 lb., if vertical seams lap.



Illustrating the Character of Work for Which the Tapered Plates Are Recommended



Examples of Tapers, as Shown in Table II

Studies Internal Fractures in Bars

Sulphur Prints Indicate Cause in an Impure Streak Inherited from Segregation in Ingot Top

BY ERNEST F. DAVIS AND ROBERT J. PETERS*

OCCASIONALLY bar stock and forgings, bought to quality specifications and seemingly sound, will for some mysterious reason break during tooling operations. The appearance of the fracture in some cases indicates an internal rupture but sometimes it does not. Chemical analysis of drillings obtained in the usual routine manner give no clue to the fundamental cause of this breakage, and microstudies in the region of the failure often do not reveal the true reason for such extreme weakness in what should be first class material.

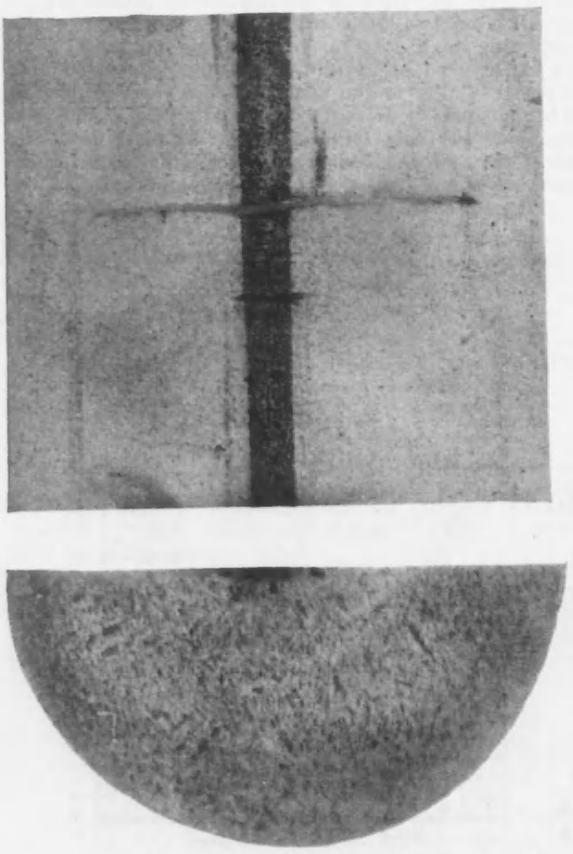
3¼-in. bar with internal rupture

A number of explanations have been offered for such failures, all of which are logical assumptions based on the evidence at hand and the circumstances surrounding the failure. In many instances these may be secondary causes. In a forging the fracture is sometimes attributed to excessive upsetting, to cracks developed from the strains of shearing, to improper forging temperatures, to the practice of quenching forgings in water, or to some other mal-practice in the forge shop. If this breakage occurs while machining hot rolled bars it may be said that the trouble is due to cold centers in billets before rolling, to too high finishing temperatures, or segregation in the bars. If the bar has been cold drawn fracture may be blamed on overworking and too heavy reduction.

Sometimes the pieces made from defective bars or forgings are fabricated in such a manner that they do not break during machining but crack subsequently in hardening. Then the cause may be assigned to some defect in the heat treating practice. But worse, the steel may survive both machining and heat treating and not fracture until the part is placed in service. It may then rupture immediately or last for six months or longer. If it does not break until after a period of service we are liable to assume that it failed from "fatigue."

All bar stock is more or less segregated with a concentration of impurities in the center of the bar. A bar of steel may be regarded as simply an elongation of the original cast ingot. Although refined by working, reduced in size and subjected to longitudinal movement of the constituents, yet the same elemental metals and metalloids are present in the bar which existed in the ingot when it completely solidified and these are in approximately the same relative position in the cross section. The impurities deposited in the center of the ingot, although extended over a greater length, are still in the center of the bar, as they were in the ingot and billet. If compounds which are rejected during the crystallization phenomena should become entrapped in the center of the ingot, on account of solidification before they could arise and become expelled, we may safely assume that a core containing these metalloids would persist in the bar. Furthermore this area containing high sulphur or high phosphorus would evince the recognized physical properties of high-sulphur and high-phosphorus steels rather than assume the properties of the outer areas of purer metal.

It is a well established fact that steels containing too much sulphur (0.20 per cent or over) cannot be safely rolled or forged due to danger of rupture on account of the weak, brittle sulphur eutectoid present. The fusing point of iron sulphide is considerably less than that of steel (approximately 2200 deg. Fahr.). Since forging and rolling temperatures are frequently at this elevation the sulphides are no doubt pasty or semi-fluid, so that they offer little resistance to rolling or forging strains. Furthermore sulphides exist as membranous films around the pearlite, thus producing weak grain boundaries. The result is that the longitudinal tension of rolling produces minute cracks in the segregated core wherever sufficient concentration of sulphur exists. Further reduction by rolling may develop these cracks for a considerable distance into the body of purer metal exterior to the core. A rup-



Longitudinal and cross-sectional sulphur print of 3-in. round bar. Long central crack extends into unsegregated metal

*Respectively chief metallurgist and metallographist Warner Gear Co., Muncie, Ind.

ture not ¼ in. long in the segregated core may be torn by rolling strains into a fissure 2 in. or more across. A bar apparently sound on the outside may therefore consist of a number of internal ruptures which would never be discovered by visual inspection of the outer surface.

A particularly bad example of this type of defect was recently found in a bar of 3¼-in. cold rolled steel of S. A. E. 1020 analysis. The chemical examination of the steel from drillings obtained transverse of the bar gave no indication that it was otherwise than first class material. The analysis was as follows:

Carbon	0.18 per cent
Sulphur	0.043 per cent
Phosphorus	0.025 per cent
Manganese	0.496 per cent

This steel was machined into flanged bushings having a drilled and reamed central hole 1¼ in. in diameter. The machine operator found a crack in the hole, although the outside of the piece showed no evidence of flaw. Microstructure adjacent to this crack showed normal constituents of pearlite and ferrite, and revealed no cause for the defect, due to the fact that the area causing the rupture had been drilled out during the machining operation and the fracture had extended for a considerable distance into good sound metal.

Cross sections were then made of the bar itself and it was discovered that large ruptures from one to two inches in diameter existed at intervals of 5 or 6 in. at right angle to the bar length, while minor cracks about ¼ in. long were present at shorter intervals, few of these extending beyond the segregated core. The sulphur prints shown were made with bromide paper on a transverse and longitudinal section. The transverse specimen was in the exact location of one of the major fissures. An intense concentration of sulphur was apparent wherever one of the larger or minor cracks appeared. Judging from the intensity of coloration, between 0.50 and 1.00 per cent sulphur exists in these areas; surely high enough to make any steel hot short in rolling.

Samples for analysis of the core were then taken by planing along the length of the core to a depth of 0.010 in. and for a width of ¼ in. These analyzed 0.21 per cent sulphur, which of course represents the average of the core segregate and not the highly concentrated sulphide patches which produced the actual fissures.

The prints made in connection with this investigation show the difference in sulphur content between the core and the surrounding metal. A sulphur content of 0.05 per cent will scarcely tinge bromide paper moistened in dilute sulphuric acid. (The low-sulphur areas of this bar analyzed 0.043 per cent sulphur). It should also be noted how the small crack originally formed in the core has extended into the low-sulphur metal. The print made of the transverse section indicates that the sulphur nucleus in the center has been the original cause of the rupture.

The existence of this condition may be more common than believed. It is not confined to this particular grade of steel, for we have found it at intervals in high priced alloy steels in just as aggravated form.

This defect is especially dangerous because of the difficulty attending its discovery before fabrication. As this example aptly illustrates, the composition of the segregated core of any bar is very important in determining steel quality and excessive concentration of metalloids is always liable to produce undependable steel. These internal ruptures may account for many unexpected breakages of parts not severely stressed, and may be the starting of many so-called fatigue failures.

Insufficient cropping of ingots and billets is possibly the major cause of this defect, because it seldom exists in more than a few bars in a heat.

Cadmium Plating Resists Rust

Addition Agents in Electrolytic Bath Give Mirror-Like Deposit of Good Throwing Power

BY C. H. HUMPHRIES*

EARLY in 1919 the Udylite Process Co., Kokomo, Ind., made commercial applications of cadmium on a variety of articles, chiefly such things as corset steel, razor blade stock, piano wire and iron and malleable castings for playground equipment. At that time there were no other commercial uses of cadmium metal for the protection of iron and steel articles against rust by either electrodeposition or hot dipping and no plating solutions of any commercial size or volume had been prepared.

At the time there was a marked paucity of information regarding the deposition of cadmium in forms suitable for finish or of any value to the electroplating art. One article by Armstrong had been printed in *Metal Industry* in 1911. A few patents have covered the application of cadmium as a protecting medium for steel, notably the Russell and Woolwick British patent dated 1848. These patents indicated its possible uses, but there had not been developed suitable solutions from which cadmium could be deposited in the proper physical form.

Since cadmium and zinc are similar chemically it was assumed that the electrodeposition of the two would have a close resemblance, but such is not true. In the electrodeposition of zinc two types of solution have been employed, one a sulphate solution and the other a cyanide bath. Cadmium plate deposited from acid solutions or from solutions of neutral salts had been of no commercial value. Laboratory work had indicated that cadmium deposited from cyanide solutions gives a different type of deposit which had promise as an electroplating finish, but even when deposited from double cadmium solutions it was very little better in appearance than that from sulphate solutions. It responded to ordinary color buffing in an encouraging manner, but the chief drawback to the application of cadmium alone was its inherent softness. Formulas which were developed in the laboratory and which apparently gave suitable deposits were not found to be satisfactory when made up in large volumes. Therefore, such formulas and the technique of application had to be devised. Furthermore, some addition agents had to be found which would materially change the type of electrodeposited cadmium with regard to its micro-crystalline structure, its appearance and its hardness.

Such addition agents have been found. They change the former soft white coatings which easily water-stain or grease-stain and which were quite easily abraded, to coats which have a high luster similar in appearance to hot dipped tin and possess a surface more resistant to rubbing. The cadmium deposited from the solution which was finally perfected is quite adherent to steel and does not lift when the steel stock is flexed or twisted. It differs considerably in this respect from hot galvanized coats. It is also necessary for the deposited coat to be uniform in thickness and free from pin holes. Fortunately the final type of cadmium plating solution evolved had a good throwing power which resulted in coatings fairly even in thickness over ordinary contours.

The chief consideration determining the thickness

* Research director, Metals Protection Corporation, Indianapolis.

of the plate is the kind of service expected of the protected articles. Obviously a brass part in a radio set is exposed to different conditions from the cap nut on a disk wheel. In the former the average thickness of the cadmium coat is approximately 0.0002 in., while on the latter the specification calls for 0.0006 in.

Cadmium is substituted for zinc as a protective coating because its deposits tend to be more even in thickness, more continuous and freer from capillaries. In addition, the silvery white color is more attractive than the dead flat, easily stained, electrodeposited zinc coat. Cap nuts on disk wheels have been used on one popular make of automobile for over three years, replacing sherardizing. The change resulted in better service from a protection standpoint and also improved appearance. The cadmium surface stayed white, whereas the buffed sherardizing coats turned black after about one season.

The following table gives some of the resistance values of cadmium coatings in the salt spray test:

Salt Spray Test 20 Per Cent Solution

Coating	Thickness (In.)	Hours in Ordinary Spray	Result
Cadmium	0.0002	1,860	No Rust
Cadmium	0.00024	1,860	No Rust
Cadmium	0.0002	1,860	No Rust
Cadmium	0.00039	1,860	No Rust
Cadmium	0.00028	1,860	No Rust
Cadmium	0.00055	1,860	No Rust
Cadmium	0.0002	1,860	No Rust
Cadmium	0.0006	1,860	No Rust
Cadmium and Nickel	0.00036	24	Slight rust at hole
		126	Badly rusted
Cadmium and Nickel	0.00036	17	Slight rust at hole and edge
		40	Coat peeled-rusted
Standard Nickel Plate		2	Indications of rust
		17	Badly rusted
		24	Coating practically gone
Electrolytic Zinc	0.00045	316	Rust
Hot Dip Zinc	0.0020	650	Rust
Sherardized	0.0009	367	Rust

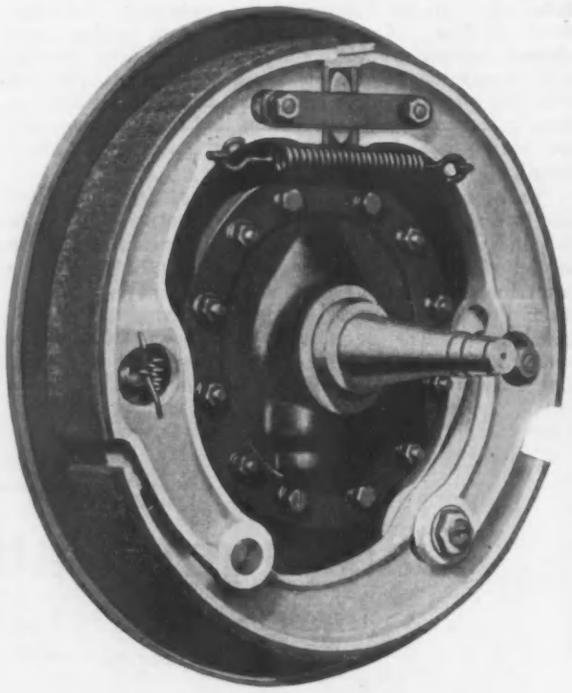
Accelerated tests, such as the salt spray, must be amplified wherever possible by observations after exposure in service. Here values differ according to the type of exposure, such as the atmospheric conditions in various localities; the parts may be buried in various soils, or immersed in various liquids.

An illustration of the last named condition is the employment of cadmium as a protection for steel in washing machine tanks. The fact that it is not attacked by caustic alkalies makes it of decided worth. In the washing machine industry, which is highly competitive, a substitute for copper or nickel-zinc tubs was sought. Steel was found to be preferable because of its strength, cheapness and ability to be straightened out if dented without any real injury, but it could not be used without proper protection. Therefore, cadmium coats approximately 0.0006 in. thick were suggested and have proved efficient. Washing machines are protected by cadmium in all vital points; the tub itself, as well as the wringer and the driving parts, are cadmium plated. The Meadows Mfg. Co., Bloomington, Ill., and the Vac-A-Tap Co., Holland, Mich., have made exhaustive tests which have shown that the protection afforded by cadmium meets the requirements of rigorous service. The Automatic Electric Washer Co., Newton, Iowa, is one of the companies which has adopted this metal as a coating for its machine parts.

In the automobile industry recognition of the value of cadmium is widespread. The Oldsmobile plant of General Motors Corporation is rust-proofing all bumper and chassis bolts and nuts with cadmium. Among other cadmium plated articles are hood latches and handles manufactured by the Dunn Steel Products Co., bolts and nuts used by the Buick Motor Co., and brake parts, such as shoes, bolts and nuts, for the Bendix Brake Co., South Bend, Ind. Automobile tire rims, which previously were zinc plated, are in some cases being cadmium plated owing to the better protection given by the latter. Some gasoline pumps have the guide rods and indicator rods which come in contact with gasoline protected by cadmium, which discolors less than nickel. In certain instances, side chains of anti-skid chains have a coat of cadmium, the cross chains being either Parkerized steel or brass.

Government specifications for airplane parts which formerly were rust-proofed with zinc now state that cadmium may be used. McCook Field at Dayton, Ohio, was the first to recognize its value, and shortly afterward the Consolidated Aircraft Corporation, Buffalo, began protecting with cadmium all its steel parts which are most subject to corrosion. The Curtis Airplane & Motor Co., the Boeing Airplane Co., and the Naval Aircraft factory at Philadelphia have recently adopted this practice. Colonel Lindbergh's famous plane, the Spirit of St. Louis, has the hub halves, ring clamps, bolts, nuts and clevis pins which complete the assembly of the propeller protected against rust by cadmium.

Over half a million radio loud speakers have their magnets cadmium plated. For the protection of brass condenser leaves cadmium has in some cases been employed instead of aluminum. A large electrical manufacturer who has been using cadmium for over four years has developed its application until he now is



Automobile brakes and wheels have essential parts cadmium plated

treating approximately 140,000 lb. of bolts and nuts a month.

Steel coffins which previously were finished in silver or were given protective coatings of various bronze lacquers, are being cadmium plated by one important manufacturer. He obtains a variety of finishes equivalent to antique silver and at the same time gives a protection against corrosion which is not afforded by the latter. In the casket hardware industry cadmium is replacing silver. Black nickel is used over cadmium to secure contrasts in the recesses, while the high lights are brought out by white cadmium which has been scratch brushed. The advantage of cadmium in this particular use lies in obtaining a rust-proofed article with a finish equal to that of silver, but at a lesser cost.

On many cameras cadmium protects steel guides and runners substituted for brass parts. Sometimes it is an underlay with a nickel overcoat.

This recital by no means exhausts the various fields in which cadmium has proved to be of value. It has come into its own in the short period of a few years, and the number of its applications is increasing daily. It has not replaced zinc in general usage, though it has been employed successfully in many places where zinc has been unsatisfactory. The same statement also is true in relation to many articles which formerly were nickeled.

Government figures for 1926 show that 800,000 lb. of cadmium as sulphide and metal was used in the United States, and of that amount 131,136 lb. was applied to the protection of metallic surfaces.

Industrial Group Insurance

About 3000 Firms Have Protected Their Employees in This Manner, Paying from 25 to 100 Per Cent of the Premium

INDUSTRIAL group insurance has been growing rapidly in favor during recent years. It insures all the employees of a company or a department at once. It provides important economies to both the employee and the company. Premiums are lower because the selling and administration costs of the insurance are reduced to the minimum (only one policy is sold and carried for the group) and medical examinations are waived. Furthermore, the cost to the individual is further lessened by his employer paying 25 per cent or more of the premium. In return for the employer's monetary expense, he is relieved of the necessity of contributing during sickness or after accident or death of his workers. It also is a factor for reducing labor turnover, especially among the older married employees.

Group insurance may be taken on a body of 50 or more persons in the service of an employer, grouped by vocation or department or by any other plan which precludes individual selection. No medical examination is required by the insurance company. If the employer pays all the premium, all of the employees in the group must be insured; if the employee pays part of the premium, at least 75 per cent of the group must participate. In no case may the financial benefits of the policy accrue to the employer.

First Policy Written in 1911

Based upon a study of group insurance, as defined above, a book has been published by the National Industrial Conference Board. The first group policy was taken out by Montgomery Ward & Co. in 1911, covering 3000 employees for approximately $6,000,000. In 1919 over one billion dollars insurance of this kind was in force, and in 1926, 4,700,000 employees were insured for $5,047,915,931, an average policy of over $1,000. This rapid growth has been due to the realization of employers that nearly half their force carry no life insurance whatever, and disability or death to one such leaves the relatives in serious financial straits. Furthermore, workmen on day wages who are insured carry on the average not more than a $500 policy, and many cannot extend the amount because of advanced age, physical defects, or occupational hazard.

Group insurance has been embraced as a plan which will improve all these undesirable conditions, and at the same time measurably improve industrial relations. It might be stated in passing that the improved labor turnover due to this cause will become less and less noticeable as more and more group insurance is sold.

The survey shows that while most of the early policies were paid entirely by the employer, the recent notable policies have nearly all been on the "contributory" plan; that is, the employee pays a considerable portion of the premium. This is regarded as a more equitable plan, less paternalistic, and assures the management that the personnel appreciates the value of the insurance by a willingness to share in the cost.

Effect on Employees' Mutual Benefit Associations

With contributory insurance has also come the sickness and accident insurance, formerly taken care of by employees' mutual benefit associations. Ordinarily the weekly benefits amount to about 1 per cent of the policy paid on death, and may or may not run a limited term. Cost of premiums varies with the conditions found by the insurance examiners in the establishment, since experience indicates that the sickness expectancy does not change with the average age of the group, so much as the percentage of female workers and the working conditions.

Mutual benefit associations have not been abandoned in these instances, however, for they are ordinarily used to administer the insurance plan, and are useful organizations to promote many other phases of industrial relations.

Amount of Premiums Charged

The amount of the premium naturally depends upon the average age of the participants and the amount of the insurance. Withdrawal of older employees and replacements with younger men keep the average age of several groups substantially constant. If any special occupational hazards exist, this would also be reflected in a somewhat higher premium. If sick and accident benefits are to be included, the proportion of sexes is a determining factor, a larger proportion of women increasing the cost. Owing to these factors, the premiums paid by different groups range from $10.50 to $12.00 for each $1000 of life and total disability insurance.

Premium costs on sick and accident group policies also vary according to such factors as occupational hazard, proportion of women, the waiting period after sickness occurs before benefits are payable, and the amount and duration of benefits. With a 7-day waiting period, protection for six months, and 90% male workers, a well managed plant could probably buy group accident insurance for about 85c. a month for $10 weekly indemnity.

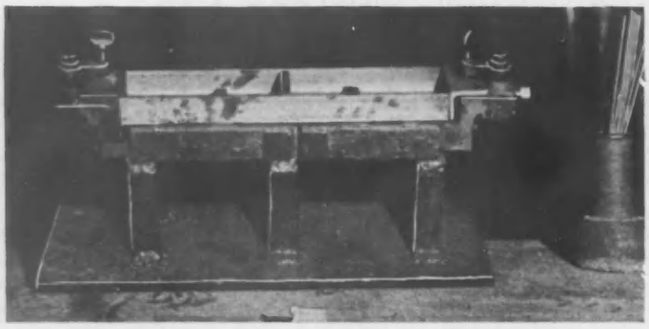
From the Manager's Viewpoint

While the whole idea of group insurance is new, the National Industrial Conference Board believes that the recent growth justifies the assertion that it has made some definite accomplishments. Some group insurance has been abandoned, but on the whole "it has provided protection, at no cost or at low rates, to about five million employees, many of whom do not have or cannot obtain adequate insurance except at relatively high rates.

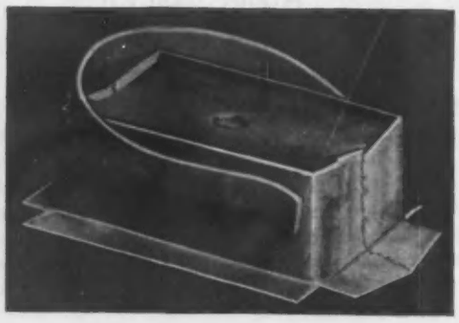
"From the employer's point of view," further to quote the report, "it is usually said that the prime purpose of group insurance is to improve relations between employer and employee. To some extent the experience of management has realized this aim. Yet the sentiment of employers on the value of group insurance varies from enthusiastic approval to condemnation and disapproval of the whole scheme. Some executives have abandoned group insurance or have retained it only because of its value to the employee; but most employers have thus far been generally satisfied with its results.

"In seeking to evaluate the results of group insurance, it should not be forgotten that in most companies such insurance is only one feature in an extensive program involving industrial relations. Naturally it is difficult to determine what influence any single project may have had in bringing about an improved condition. Whatever advantages accrue to the management are indirect and rest upon the assumption that, when presented with a free policy or one that costs them little, the workers will be more closely connected with the organization and therefore more loyal and stable."

Jigs, Little and Big, for

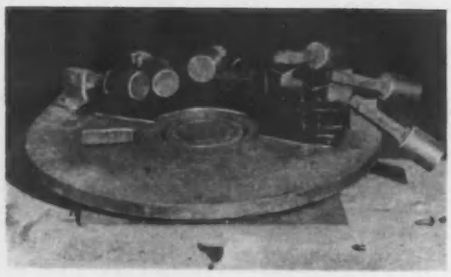


FIXTURE for assembling steel base rails for Lincoln Electric Co.'s motors. Made for $12.75 of welded steel. Note hinged hold-down clamps and set screw for endwise squeeze at right.

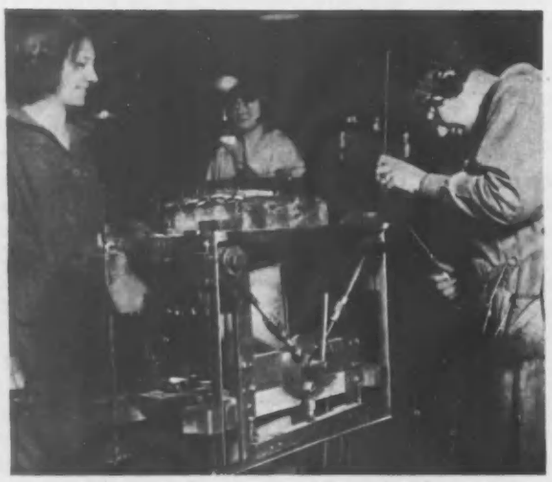


A JIG does not need to be complicated to produce sleeves of accurate dimensions; a mandrel and heavy clip will serve. (Courtesy Linde Air Products Co.)

STEEL barrel shell laid on rigid horn of I-beams, held down fast by slotted bar, hinged at rear. Upper bar may be water cooled to absorb excess heat, counterweighted from above, and held down by clamp at outer end. (Courtesy, Tokheim Oil Tank & Pump Co.)



BLOWER segment located by pins on round slab; vanes registered for welding by counterweighted arms. Slab turns for operator's convenience. (Courtesy Lincoln Electric Co.)

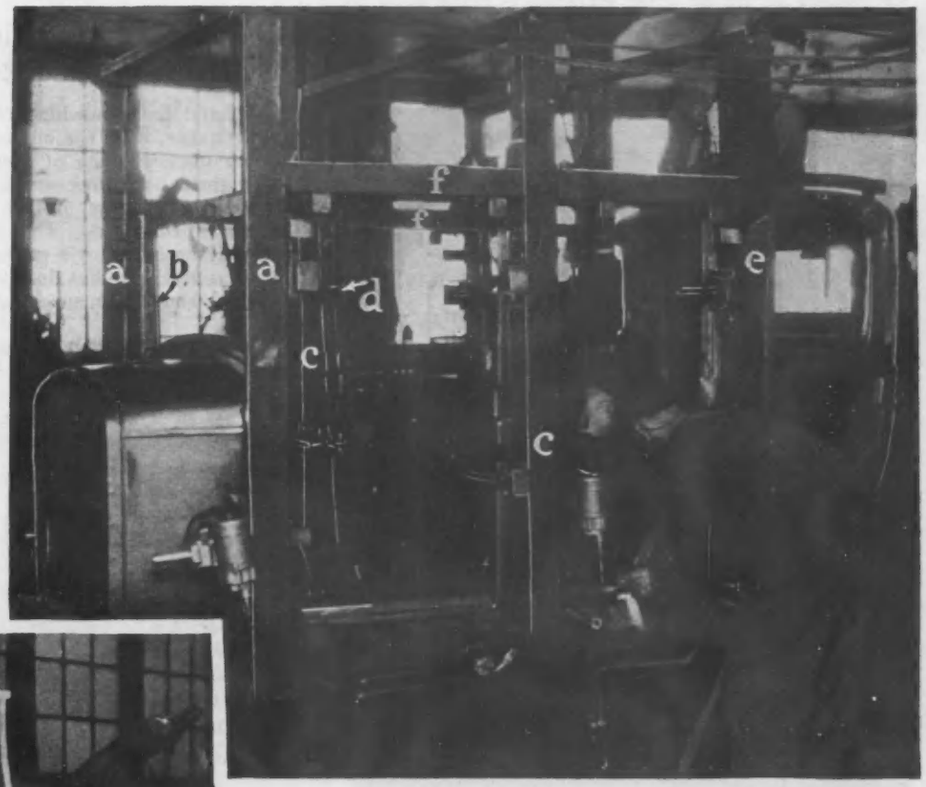


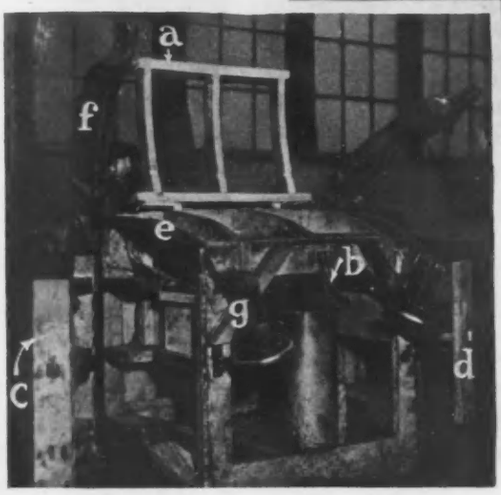
ONE girl unloads and sets up a new door frame while the other welds the corner joints. A slight turn on the wrist plate unlocks all grips. Jig rotates around mast, so operators need not change positions. (Courtesy Studebaker Corporation of America.)

SPOT welding cross-tie to end of side rail. Jig loaded by helper and carried along on overhead trolley. Note construction of two hold-down clamps, designed with rugged toggle joints for quick and positive action. (Courtesy Edward G. Budd Mfg. Co.)

Welding Sheet Metal

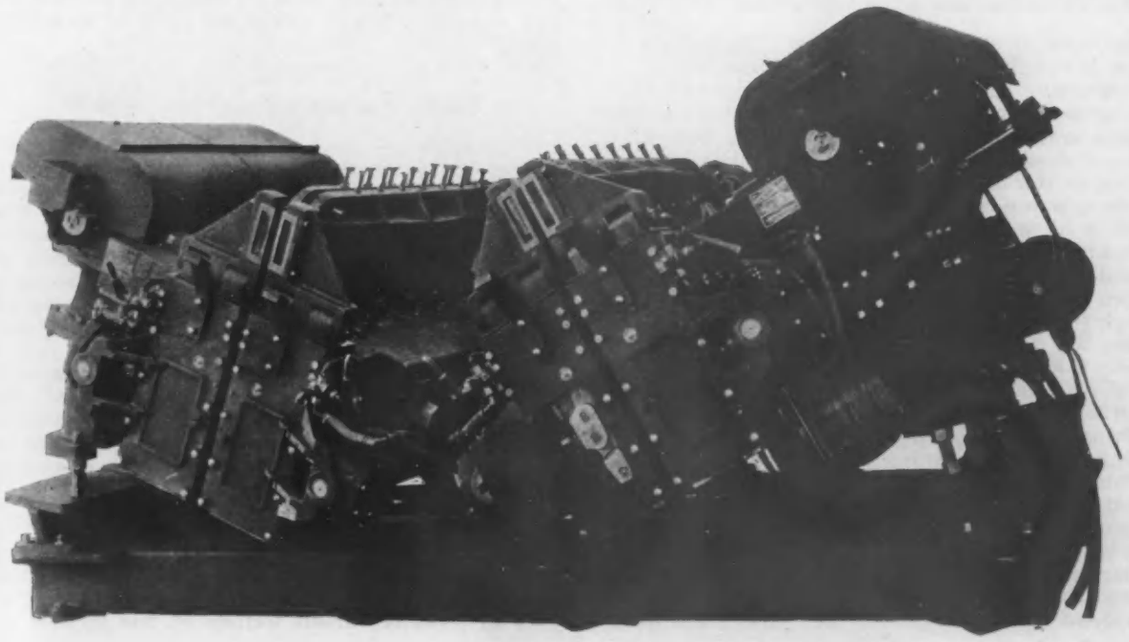
ASSEMBLY jig (at right) for various fabricated units, each one complete in itself, to form an all-steel automobile body. Standards (a) (a) fix the wind shield and cowl (b); the middle standards (c) (c) fix the central door posts (d); the standards (e) locate the rear section of the body. Roof and top door jambs are held by suitable clamps from the horizontals (f). (Courtesy Edward G. Budd Mfg. Co.)





JIG for aluminum tonneau (left). Rear sheet formed and placed on top, registered by appropriate stops, held down by hinged frame (a) which is clamped by latch (b). Side sheets placed at right and left, and frames (c) and (d) clamped home. Accurate contour at corner forced between lower bar (e) and upper bar (f) held down by hand-screw (g) thrown up and over the end of (f). Welding then done through slot in bar (f). (Courtesy Linde Air Products Co.)

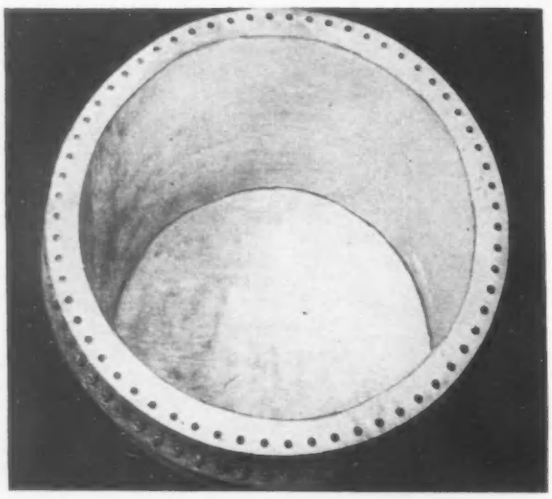
A FLASH welder (below) is a combined jig and butt-welding machine. This is the largest ever made by the Taylor-Winfield Corporation. It welds two seams 72 in. long at once on steel sheets for automobile bodies.



LEAD-COATED PLATES

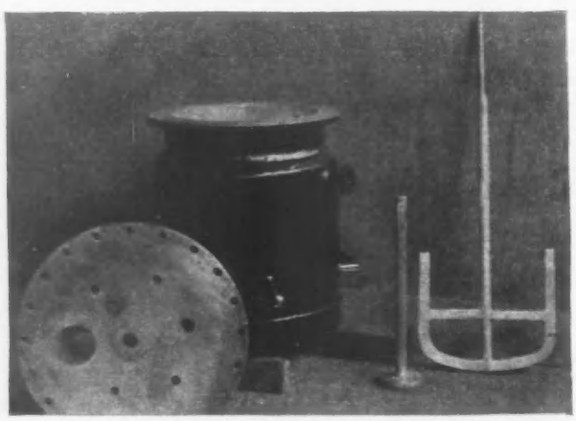
Protective Covering of Any Desired Thickness Available for Tanks

COATING of steel with lead without an intermediate coating of tin or other material is being done by Samuel Smith & Son Co., Paterson, N. J., in conjunction with the Chemical Equipment Mfg. Co., also of Paterson. The process was developed in Europe, where



Inside of Steam-Jacketed Tank Fitted with a Homogeneous Lead Lining

(Below) Some Special Parts and Fixtures Lined or Coated with Lead. A small steam-jacketed autoclave is shown, with a homogeneous lead-coated stirrer and lead-lined thermometer pipe



it has been in use for some years. The method by which the coating is applied is not divulged.

Chemically pure lead is used and thicknesses up to 1 in. or more may be applied. The lower limit for commercial work appears to be about ⅛ in., although a representative of THE IRON AGE saw material with a coating as thin as 1/32 in. This material was given in his presence a severe bending test, resulting in breaking in two a mild steel sample measuring ⅝ in. in width and ⅛ in. thick. Placed in a vise, this was twisted back and forth by means of a long-handled wrench and eventually bent forward and backward enough to crystallize the steel and sever it. The lead coating did not appear to be distorted at the point of break. It was torn somewhat where the wrench gripped it, but so, incidentally, was the other side of the sample, which was the soft steel backing.

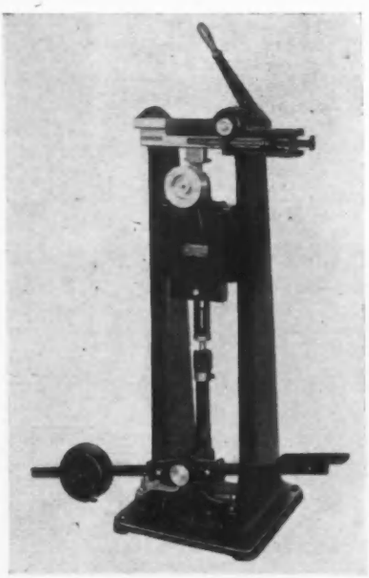
Principally this lead-coated material is used in making chemical apparatus for operating conditions involving heat, pressure or vacuum, wherever lead is indicated as the corrosion resistant material and another metal is necessary for strength. There are, however, many other applications of this process, such as coating or lining of pipes, coating of wires, and in fact covering almost any metal in any shape.

Vacuum evaporators, tanks and pans, steam jacketed and internally heated boilers, agitators, stills, cooling and heating coils and tank cars are included in the apparatus made by this process. The intimate adhesion of the lead to the steel or other base metal is claimed to form an inseparable junction which could not be penetrated by acid, even were the lead cut or broken.

Machine for Marking Edge of Cups and Rings

Demand for a machine for marking the outside of metal flanges, near the outside edge of cups and rings, cooking utensils, etc., of large size, led to the design of the special marking machine here illustrated, which has been brought out by the Noble & Westbrook Mfg. Co., Hartford, Conn. The machine incorporates features of the company's standard No. 3 hand-operated marking machine, but in place of the regular table, a special slide with special roll fixture has been substituted.

It is claimed that by the use of this design any size up to 2 ft. in diameter can be marked on the outside



Any Size Up to 2 Ft. in Diameter Can Be Marked on the Outside, Near the Edge

in a position near the edge. A flat marking die or steel type set in a holder is used to make the mark. For marking dishes, rings and large round articles the machine has the advantage of having no projecting table to limit the size of piece marked. The work holder is a part of the machine. Operation of the machine is similar to other of the company's units, the die being passed over the work through a forward motion secured by a rack and pinion operated by a hand lever.

Blast Furnace Slag for Roads

Utilization of blast furnace slag in highway improvement has been investigated under the Missouri School of Mines, and is reported upon by Dr. Clarence E. Bardsley in a booklet of 115 pages, illustrated. The work was done in partial fulfillment of requirements for the degree of doctor of science in the University of Michigan. About two-thirds of the volume is occupied by a bibliography extending over a considerable period of years, and covering books, booklets and periodical articles, as well as engineering papers.

The conclusions and recommendations are somewhat voluminous. In general, it is stated that slag will not split as almost all stone will. Its age seems to make no difference in its behavior and it can be handled as well as any other aggregate in concrete, when the construction force learns its peculiarities.

The William B. Pollock Co., Youngstown, Ohio, which built the No. 2 blast furnace, Weirton Steel Co., Weirton, W. Va., has issued a booklet giving several close-up views of various sections of this furnace.

Opposed Holes Ground Simultaneously

New Duplex Internal Grinder Has Automatic Features, Including Truing of the Wheel and Sizing of the Work

THE grinding of two opposed holes in accurate alinement is the function of the internal grinding machine here illustrated which has been built by the Heald Machine Co., Worcester, Mass. This machine, designated as the Size-Matic Duplex, is intended for such work as the grinding of wrist pin holes in pistons, holes in cluster gears and other pieces requiring holes of approximately the same size as to diameter and length.

While adapted for grinding two holes, using independent control of size on each hole, the machine is designed to operate as simply as a machine for grinding single holes and to be fully automatic in regard to speed, feeds, the truing of the wheel and sizing of the work. The latter is accomplished without plugs, gages or any connection with the work whatever.

The general arrangement of the machine may be noted from the illustration. It is made up of a base casting on which are two main tables carrying the wheel heads, that are without crosswise movement. These tables are driven hydraulically with a single control and are mechanically connected so that they will synchronize when in operation. There is a cross slide which carries the work head and fixture as well as the diamond for truing the wheels. The hole in the work spindle into which the fixture is inserted is approximately 7¼ in. in diameter and 10 in. long; this furnishes in a general way an idea of the capacity of the machine. The machine is motor-driven and all moving parts are mounted on anti-friction bearings.

The base casting weighs approximately 5000 lb. It has flat and V ways at the right-hand end, while at the left it is arranged for an intermediate swiveling member with flat and V ways between the base and the table. The workhead also swivels on the base, and this construction is stressed as permitting absolute alinement of the two wheelheads in relation to the workhead. Guards cover the ways at all times.

The tables are operated hydraulically by a constant-pressure oil system, as on the company's style No. 72 machines. This drive permits complete control of speeds or direction of table movement at all times, and also makes possible an automatic change of speeds in roughing, truing and finishing, as well as a quick withdrawal. Movements of the tables are synchronized by racks and pinions and, if desired, the relative position of one table to the other may be changed. A wide variety of table speeds up to 50 ft. per min. is available.

A cam on the rear of the right-hand table controls the movement of the diamonds as well as the slow-down movement mechanism for the tables. A cam on the rear of the left-hand table starts and stops the workhead and controls the water supply. Three adjustable dogs on the right-hand table control the stroke of the tables; two are set for the grinding stroke while the third, a sliding member, automatically operated, permits the tables to withdraw so that the wheels will pass the diamonds during the truing operation. A dog and pawl on the left-hand table, operating through a lever, actuate the cross-feed for the workhead, and also the wheel wear compensating mechanism, both of which are on the cross-slide.

The wheel spindles and extensions are clamped in scraped straight bearings in the wheelhead bases, and the wheel spindles are mounted in special ball bearings which take radial and thrust load. The flexible idlers are also mounted on ball bearings, and are arranged with spring belt tighteners. As the wheels leave the work, guards swing down over the wheels, fully protecting the operator. The workhead spindle is mounted on two special ball bearings. It is stated that special care has been given to the construction of this head and that these bearings are mounted under a definite initial load, providing very rigid and free running bearings. The squareness of the bearings has also been given close attention. A pulley on the spindle is driven from the rear shaft by a belt over a flexible positive drive to the spindle and work. The workhead starts and stops automatically or can be controlled by a lever at

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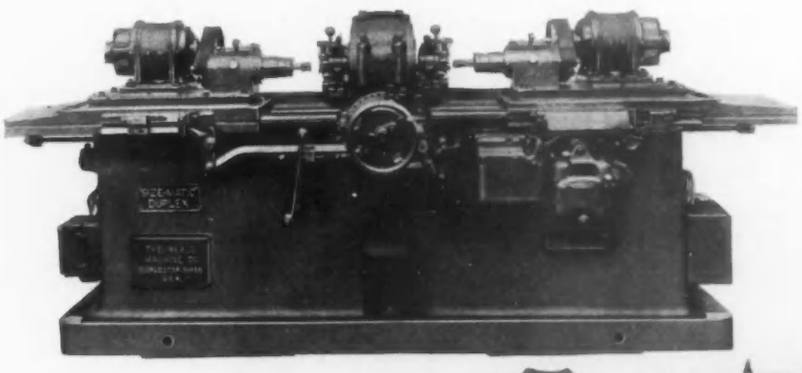
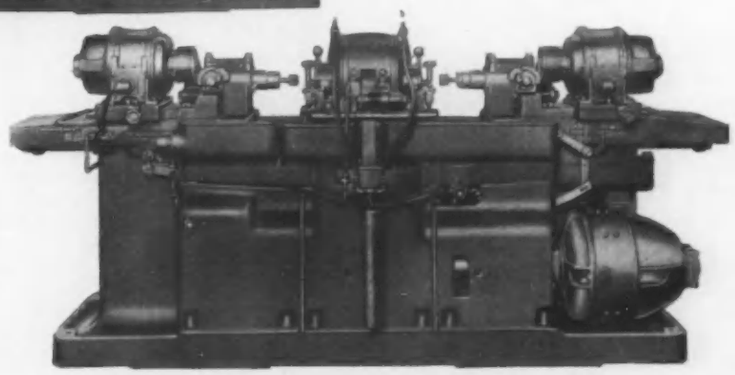


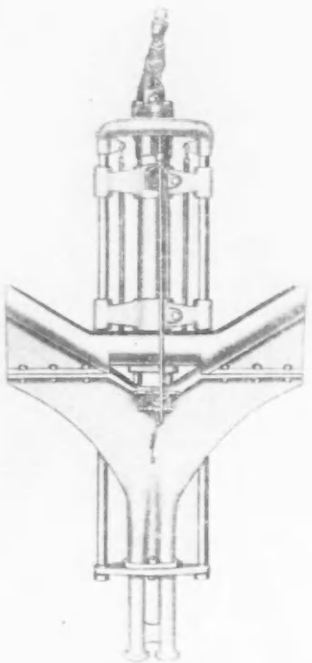
TWO Main Tables Carry the Wheel Heads, Driven Hydraulically Under a Single Control and Mechanically Connected for Synchronism



AT the Right Is the Rear View of the Heald Size-Matic Duplex Internal Grinding Machine, With Automatic Features Which Include Wheel Truing

Mechanical Floor Nailer Has High Capacity

Floor nailers adaptable for use in car shops, shipbuilding yards and on bridge floor work are being manufactured by the Duplex Automatic Nailer Co., Logansport, Ind. These machines are operated by air pressures of 90 to 120 lb. per sq. in., and they are designed to drive into hard wood 20 to 60-penny spike nails at



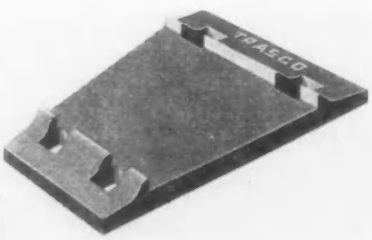
A Magazine-Fed Pneumatic Nailer, Which Drives 20 to 60-Penny Spike Nails at the Rate of 1200 to 1800 per Hr.

the rate of 1200 to 1800 per hr. The weight of a nailer complete with hammer is 78 lb.

The air hammer, which is mounted on two crossheads, is movable up and down on the guide rods, the weight being taken by springs. When the crosshead assembly is drawn to its extreme upward position, a trip of an automatic feed mechanism is opened, allowing two nails to enter, one in each of two nail pockets. The crosshead assembly is then lowered until nail sets rest on the heads of the nails. Air pressure is then applied by the operator. Two 20 to 60-penny nails can be driven simultaneously in approximately 3 sec. This period includes the time required for the complete driving operation and moving the nailer from one position to another along the floor.

Trasco Trapezoidal Tie Plate

The Track Specialties Co., 29 Broadway, New York, has designed and patented the Trasco trapezoidal tie plate for railroad use, which, it is asserted, provides eccentricity in the most economical way. Being wider on the outside than on the inside, it will, the company states, settle absolutely level, thus obviating the necessity for a long heel. The short heel prevents the plate from curling, so the thickness has been reduced. These items, together with the saving due to the shape of the plate, effect an economy which, the company says, may amount to as much as 25 per cent or more.



Economies as High as 25 Per Cent Are Claimed for This Tie Plate for Railroad Tracks

The plate is 9 in. long, 8 in. wide on the outside and 5 in. wide on the inside, with the center of the rail coinciding with the center of the tie plate. This, it is said, will give the same level settling as a rectangular plate 10 in. long with an eccentricity of ½ in.

Post Power Squeeze Molding Machines

Savings in floor space, and rapid and economical operation, are emphasized in connection with the power squeezer here illustrated, which is being placed on the market by the Tabor Mfg. Co., 6225 Tacony Street, Philadelphia. The machine is furnished in both the plain squeeze and jar squeeze types. It can be supplied either as a stationary or a portable unit, and an additional portable design with a wheelbase that will straddle a sand heap 19 in. high and 60 in. wide is also offered.

The table of the machine is 16 in. wide by 19 in. deep and is capable of accommodating all flasks that would be considered for machines of this type. The squeezing cylinder is 10 in. in diameter and is located above the table of the machine. This cylinder is arranged so that it may be swung quickly into and away from the squeezing position, this being accomplished

Portability, Rapid and Economical Operation and Savings in Floor Space Are Features

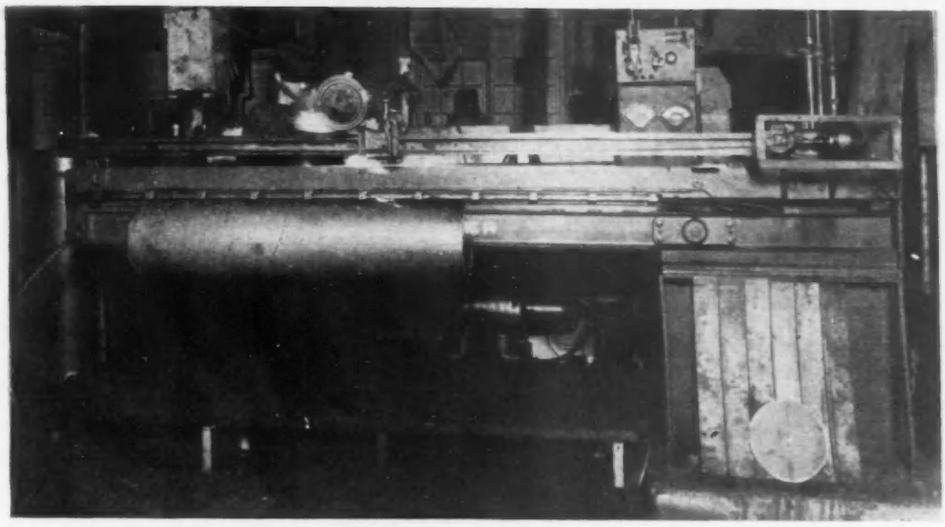
by a handle located conveniently on the squeezing head. The same handle controls the squeezing operation by a slight downward pull. Each machine is equipped with vibrator, pressure gage and blow valve.

Safety Work Saves Many Lives

Organized accident prevention efforts have conserved the lives of 122,764 persons since 1913, according to estimates by the National Safety Council. This is about the total number of deaths in the United States armed forces during the World War. If deaths from automobile accidents were not considered, a saving of 284,296 would have been shown. The figures are based on the rate of accidental deaths in 1913 and the average rate of the 10 preceding years.

From 1913 to 1926, inclusive, accidents have caused the deaths of 1,146,428 persons, instead of the 1,269,192 based on the 1913 rate. During that period 160,732 people were killed by automobiles, which is 102,889 more than if the 1913 rate had been maintained.

While the United States Steel Corporation, the International Harvester Co. and other industrial concerns were engaged earlier in safety work, it was not until 1913, when the National Safety Council was organized, that industrial leaders generally began in earnest to attack this vital problem.



Welding of Range Boilers of 14-Gage Steel Is at the Rate of 150 Ft. per Hr. The cost is around 1c. per ft. of longitudinal seam

Automatic Carbon Arc Welder for Range Boilers

An automatic carbon arc welding machine developed recently by the Lincoln Electric Co., Cleveland, for the welding of range boilers is shown in the accompanying illustration.

The speed of welding 14 gage steel is said to be 150 ft. per hr., and the cost slightly over 1c. per ft. of longitudinal seam. The cost per foot on the head seams is somewhat less than on the side seams. The side seam is welded with a filler rod which is laid on the seam and fused into the joint by the carbon arc. The range boiler is slipped on the mandrel of the machine and the top clamps are lowered to hold the seam in position. Water-cooled copper guards confine the arc to the seam. The clamps also carry the upper rail on which is mounted the carriage for the automatic welding head. The operator merely starts the arc, and the motor driven head is carried along the seam, fusing the filler and the edges of the seam together.

Although designed primarily for the completely welded range boiler, the machine is adapted also to the welding of the riveted-and-welded range boilers. In this type of construction the rivets are spaced rather widely and the weld is applied to the lap for pressure tightness.

Brick Unloader With Spring Suspended Conveyor

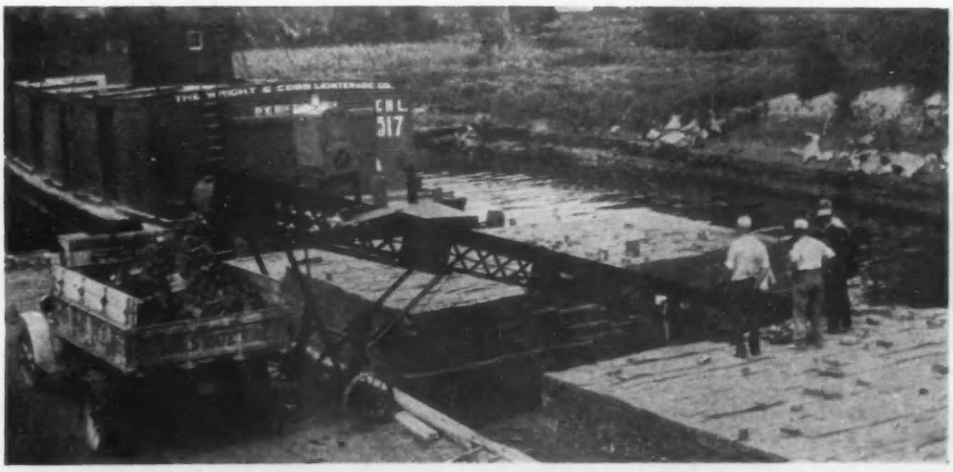
Unique construction of the loading end features the brick handling device recently developed by George Haiss Mfg. Co., New York. It is equipped with wire belt, 20 in. wide, running on ball bearing rollers. These rollers are mounted on a spring suspended box which allows the rollers to release under the jar of the brick thrown on the belt by the laborers. Experience shows that this is a satisfactory and suitable device for handling brick or similar lumpy material. The head and tail pulleys are large in diameter, lagged with oak, and driven by a Diamond 1½-in. pitch roller chain by an electric motor or gasoline engine.

The conveyor frame is 40 ft. long. The upper end is mounted on swivel wheels. The loading section is mounted on a two-wheel truck which has a "fifth wheel" swinging arrangement and a pole extension that allows the laborers to move it and steer it in the desired direction. The upper end wheels can each be swiveled to run parallel with the road, or can be turned as shown in the view for moving in and out. These wheels are connected to the axle by means of knuckle axles like those used on auto trucks. The axle is joined to the conveyor by 2½-in. extra heavy pipe, so arranged that one is stationary and the other is pivoted. The conveyor can be raised by drawing the ends of the supports closer together by means of a winch.

Alloy Steel in Racing Cars

Characteristics of alloy steel used in the Duesenberg racing cars have been studied by Thomas H. Wickenden of the development and research department, International Nickel Co., New York. In particular, the study relates to gears and shafts, together with the motor crankshaft and the rear axle shaft. Analyses of these three items are given in the table.

Per Cent	Supercharging Gears	Crankshaft	Rear Axle Shaft
Carbon	0.08 to 0.14	0.25 to 0.30	0.34 to 0.40
Manganese	0.30 to 0.60	0.45 to 0.65	0.45 to 0.75
Phosphorus	Max. 0.04	Max. 0.04	Max. 0.04
Sulphur	Max. 0.045	Max. 0.04	Max. 0.04
Nickel	4.50 to 5.25	1.25 to 1.75	2.75 to 3.25
Chromium	.....	0.60 to 0.75	0.60 to 0.95
Molybdenum	.....	0.15 to 0.25	.....
Silicon	.....	0.15 to 0.25	.....



Swivelling Wheels Give Easy Portability to This Conveyor Unloader

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

Steel ingot output is now close to normal and renewed expansion waits only on demand.

Gradual upward trend in unfilled orders may presage slowly increasing prices.

Too much pig iron has been produced so far this year and further curtailment is needed to clear the situation.

Commodity prices have begun a slow upward movement which may cause steel prices to follow shortly.

EVERY once in a while the trite sayings of the past recur to us with a fresh appreciation of their truth. The steel situation, for example, now suggests the threadbare observation that the darkest hour occurs just before the dawning. Most reports are decidedly gloomy, indicating that the volume of new business is small, that inquiries are disappointing, and that considerable competition exists. It is not clear just where improvement is to come from.

But the general feeling is that the markets are "untested," which means that buyers are holding off and that the consumers are maintaining rates pending a final showdown. Such a condition often exists at turning points in the industry. Moreover, whatever the reason, it is a fact that scrap prices have advanced, and we also have the impression that there has been a little gain in interest among pig iron consumers. These are usually among the earliest symptoms of a turn for the better.

Steel Changes Unusually Slight

OUR steel chart this month shows a small decrease in production, a slight gain in unfilled orders, and a practically unchanged price level for finished steel.

The July steel ingot output at 3,178,000 tons is 101.9 per cent of our estimated normal for the month and comes close to fulfilling the prediction ventured a month ago. It represents an annual rate about the same as that which existed last December, and, with that exception, is the lowest since June, 1925. In other words, steel production is at a level which during the last few years has proved sufficiently low to allow an adjustment between demand and supply and a renewed expansion of output.

It is true that at present the volume of unfilled orders is smaller than it has been at similar times in the past, and business in general is somewhat less active. It may be doubted if the usual seasonal expansion of as much as 5 per cent will occur in August. Indeed, a moderation in the production schedules seems desirable from the point of view of prices. Nevertheless, it seems equally probable that little further decline in steel production will be required this fall and that a moderate recovery will take place later on.

Unfilled Orders Low, Despite Gain

The July unfilled orders of the Steel Corporation at 3,142,000 tons were only 64.5 per cent of the average for the six years 1921-1926. Considering the season, this is the equivalent of an annual rate of about 67 per cent and that stands in sharp contrast to 74.9 per cent a year ago. It compares with 66 per cent in July, 1924. In 1925, and again in 1926, our adjusted index of unfilled orders reached the low point in August, while in 1924 July was the bottom month. This year, however, it seems probable that, allowing for the seasonal factor,

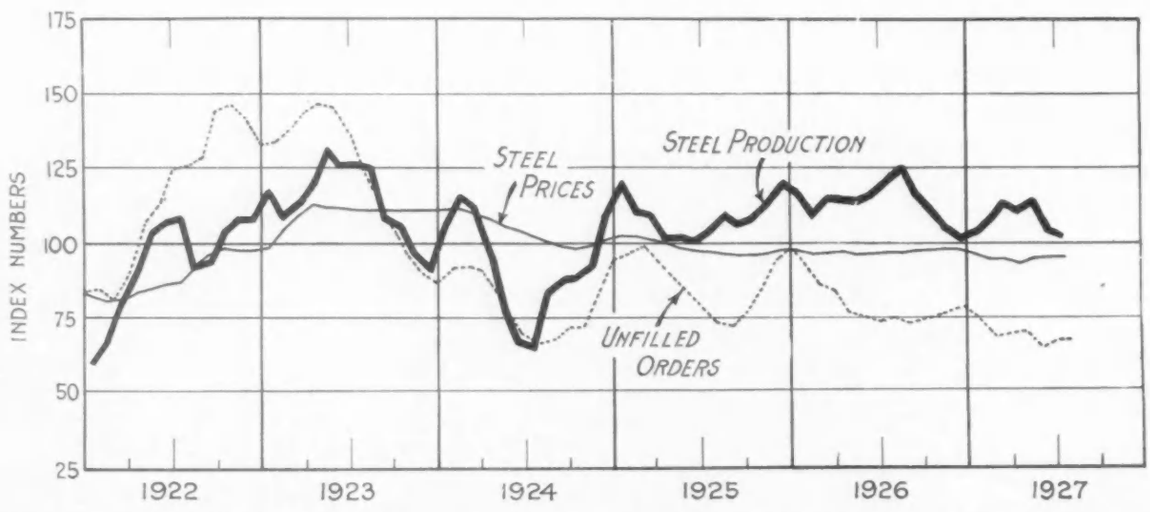


Fig. 1—Steel Production Has Come So Close to Normal That a Renewal in Demand Will Cause Expansion in Output. Prices have been virtually unchanged for months. Unfilled orders have made a slight recovery from an unusually low level

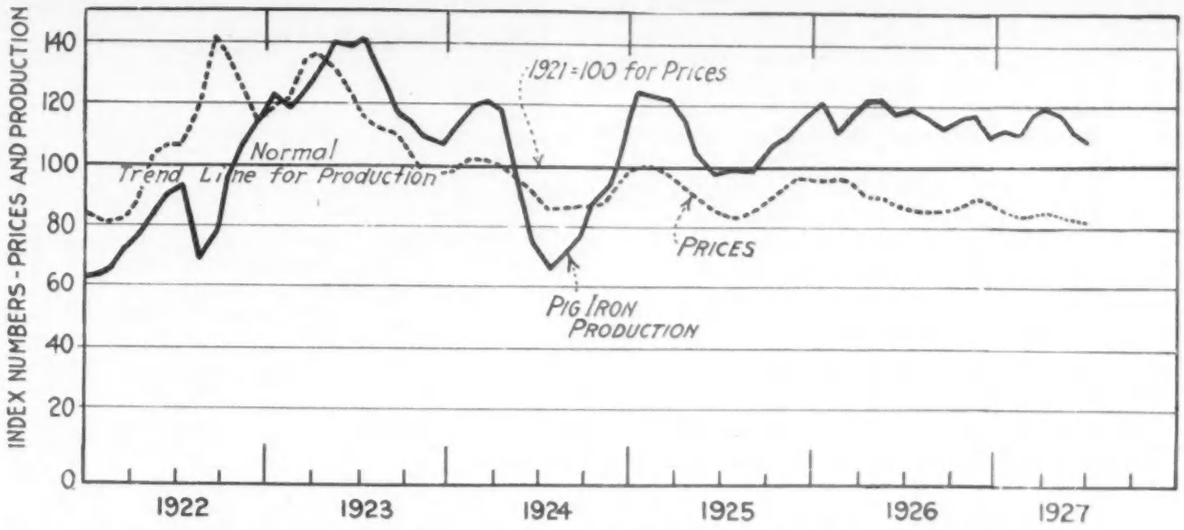


Fig. 2—Reduced Output and Continued Drop in Prices of Pig Iron May Be Expected to Continue Until Demand Absorbs Supplies. All signs point to further weakness before recovery begins

the May figure will prove to have been the lowest, the adjusted index for that month being 64.5.

This gradual upward trend in unfilled orders may well turn out to be significant. The gains have been small and the increase of 88,000 tons last month was less than expected. It was larger, however, than that which usually occurs at the season, and it is to be remembered that July had only 25 working days. If we assume a steady upward trend, the shortness of the month would naturally tend to reduce the gain in unfilled orders.

As to prices, THE IRON AGE composite index of finished steel averaged 2.367c. in July, against 2.369c. in June. It has remained practically unchanged since last March. While it is not unlikely that some concessions will develop before much expansion in production occurs, higher prices seem probable toward the end of the year.

Pig Iron Production Still Too High

THE statistical position of pig iron continues to be weaker than that of steel. The plain fact is that too much pig iron has been produced throughout the last eight or nine months. Nor has curtailment in pig iron production been sufficient yet to restore the equilibrium of the market. Our index of pig iron production for July indicates an output more than 7 per cent above the normal requirements of the country. This is over 5 per cent above the level that would indicate a normal alinement with steel production.

At 2,951,000 tons the July production decreased more than usual from June. The adjusted index fell from 111 per cent of normal in June to 107.7 per cent in July, which compares with 118.7 per cent a year ago. Thus considerable progress has been made toward accomplishing the necessary readjustment. In view of the relatively lower level of steel production, however, and the continued weakness of pig iron prices, it seems that further curtailment is desirable. We consider it probable that either in August or in September pig iron production will fall to a level at least 200,000 tons lower than in July—perhaps down to around 90,000 tons on the average daily basis.

Pig iron prices continue to sag. The average of THE IRON AGE composite for July was $18.56, against $18.92 in June and $19.51 a year ago. At this writing the composite has fallen to $18.13. No strength in pig iron can be foreseen until production has been curtailed further and the stocks of merchant pig iron cease to accumulate. Though it continues probable that pig iron prices are near to the low point of the year, it seems doubtful if advances will occur for another 30 days. In the meanwhile some further concessions are to be expected as the market undergoes the process of being tested.

General Commodity Prices Firmer

ONE of the most noteworthy occurrences last month was the rise in the Bradstreet index, which was 1.6 per cent higher on Aug. 1 than on July 1. Of course, this recovery may prove temporary, but we are inclined to think that it marks the beginning of a mod-

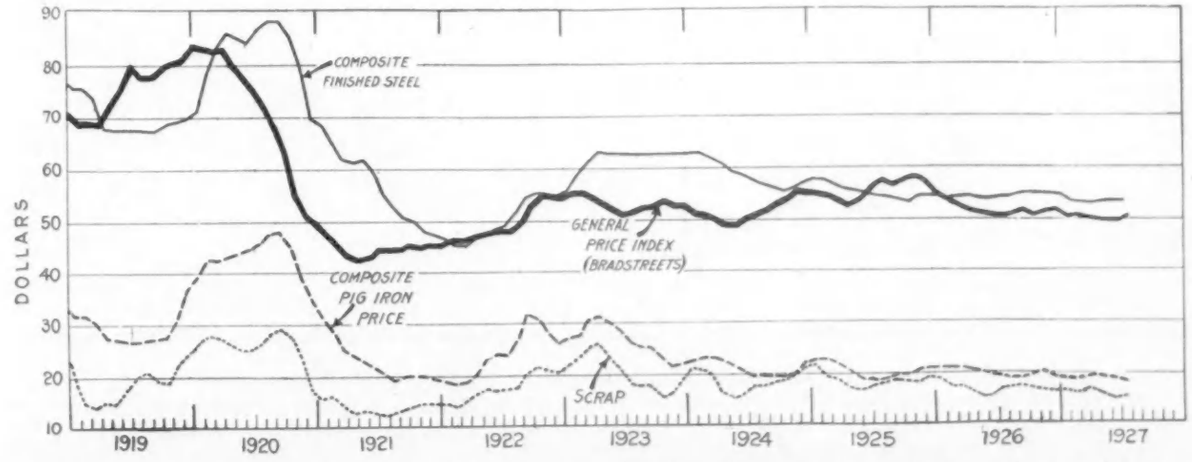


Fig. 3—While the Finished Steel Price Index Remains Somewhat Above the General Commodity Level, It Appears Probable That It Will Advance Shortly, in Keeping with an Upward Movement in Commodity Prices

erate rise in commodity prices that will last for several months.

Such a turn is pertinent to the steel situation in that, as the third chart shows, steel prices almost always follow the Bradstreet index. Finished steel averages a little above the usual relation to the general level of prices, and in such cases will sometimes respond slowly. Nor is it yet certain that any large advance in the general level of commodity prices is to be expected. But it can be said that the general price situation is such as to indicate that little further decline in steel is probable.

At the bottom of the chart are shown the trends of pig iron and steel scrap prices. It will be noted that the two are averaging much as they did in June, 1924, and in June, 1925. The advance in heavy melting steel scrap has been sufficient to affect the monthly average which, as reported by THE IRON AGE, for the Pittsburgh market was $15.05 in July against $14.81 in June.

On the other hand, pig iron prices are declining, as already noted. This is a common situation. Usually steel scrap prices lead the pig iron market, often by about three months. If this relationship is to exist during 1927 it would be reasonable to expect pig iron prices to hit bottom in September and to firm up in October. In that event strength should appear in the finished steel market by November.

While not relying on such an empirical basis entirely, the foregoing suggestion seems fairly probable. For one thing the ratio of steel production to the output of pig iron has now fallen to a point which will probably force a speedy readjustment in production to a sounder position. Already pig iron production is being curtailed more rapidly than is the output of steel ingots. Again, finished steel prices are being sufficiently well maintained to indicate that there will probably be support for higher raw materials, and the small but steady advance in unfilled orders tends to confirm this conclusion.

Where Steel Exports Went in Fiscal Year

Canada Took 494,959 Tons of Nine Leading Items—Japan Retains Second Position with 177,251 Tons, Followed by Cuba with 52,570 Tons and Argentina with 52,007 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	June		12 Months Ended June		June		12 Months Ended June		June		12 Months Ended June	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*10,126*	*14,070*	*140,358*	*118,874*	*14,108*	*12,410*	*176,252*	*159,894*	*12,136*	*11,563*	*179,125*	*149,098*
Canada	8,613	12,014	107,533	101,722	4,603	2,631	34,979	28,904	6,963	5,835	73,136	53,546
Japan*	162	....	753	468	5	246	3,907	5,731	1,997	4,913	75,643	77,247
Cuba	9	33	828	1,602	685	422	12,843	11,845	73	125	1,041	816
Philippine Islands	237	1	(a)	1,174	1,534	1,368	19,243	19,342	327	....	....	1,014
Mexico	47	124	1,347	1,675	592	952	8,149	10,070	146	....	....	426
Argentina	....	....	....	....	1,428	1,324	10,455	8,517	197	....	2,350	999
Chile	....	90	....	....	41	292	6,166	2,021	333	40	....	....
Colombia	....	....	....	....	966	358	8,439	7,740	....	....	....	....

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	June		12 Months Ended June		June		12 Months Ended June		June		12 Months Ended June	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*11,320*	*14,495*	*214,573*	*147,284*	*5,004*	*4,597*	*43,149*	*64,751*	*2,740*	*2,320*	*27,773*	*35,903*
Canada	3,652	1,090	28,632	24,782	498	1,104	4,279	4,377	1,120	902	12,418	11,069
Japan*	847	1,203	38,947	6,260	....	....	....	....	....	69	1,939	1,141
Cuba	304	737	19,519	23,321	596	233	2,344	3,842	85	73	1,314	1,587
Philippine Islands	534	....	3,912	4,786	288	453	2,083	4,832	14	....	....	....
Mexico	518	150	10,303	4,468	510	551	4,346	5,856	481	444	2,803	5,436
Argentina	178	....	....	....	563	10	1,750	5,711	323	193	687	3,512
Chile	298	5,011	1,591	10,303	....	....	....	....	....	....	....	84
Colombia	....	201	2,045	5,576	....	438	5,258	6,577	....	....	....	....
Brazil	573	50	30,844	4,925	1,052	296	5,428	9,883	33	95	1,539	157

	Tin Plate				Steel Bars				Plain Heavy Structural Material			
	June		12 Months Ended June		June		12 Months Ended June		June		12 Months Ended June	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*18,543*	*12,432*	*305,202*	*181,948*	*6,874*	*8,630*	*126,280*	*124,240*	*11,744*	*15,945*	*147,317*	*136,991*
Canada	4,188	3,685	48,450	35,272	4,723	5,877	69,543	75,724	9,566	13,886	115,989	105,078
Japan*	2,707	814	50,405	45,691	79	53	1,521	1,592	574	294	4,136	2,332
Cuba	740	199	5,320	3,246	294	335	2,668	5,350	659	678	6,693	9,506
Mexico	1,250	517	11,601	5,798	44	334	....	2,352	120	....	....	....
Argentina	2,622	450	36,765	6,485	1	20	....	....	33	....	....	....
Chile	251	302	6,792	6,385	176	190	....	....	110	16	5,909	2,598
United Kingdom	....	....	7,991	....	456	....	20,418	....	....	....	....	....
China	1,385	911	26,849	20,944	....	....	....	....	....	....	....	....
British India	....	1,458	....	11,312	....	....	....	....	....	....	....	....
Italy	758	1,125	6,027	7,933	....	....	....	....	....	....	....	....

*Including Chosen (Corea).
(a) Not reported.

Schedule of the next installments of the ***Business Analysis and Forecast****, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Aug. 25****—General Business Outlook;* ***Sept. 15****—Activity in Steel Consuming Industries;* ***Sept. 22****—Position of Iron and Steel Producers.*

H. J. Freyn, President of the Freyn Engineering Co. (At the Left), When Contract Was Closed with Soviet Representatives

GETS SOVIET ORDER

American Firm to Be Consultant in Expansion of Steel Industry

PROPOSED expenditure of $350,000,000 over a period of five years, for expansion and improvement of the iron and steel industry in Russia, has been given further impetus as the result of a contract recently signed by the Soviet Government and the Freyn Engineering Co., Chicago. In undertaking the development of the iron and steel industry in Russia, the Government apparently does not wish to meet competition in neighboring countries, but intends merely to put the Russian industry in such condition that it will supply the needs of the Russian people both in peace and war times. The industry will be under Government control, thus eliminating competition.

Prior to the World War the iron and steel industry in Russia was largely under the control of foreign capital, and it had been developed primarily for war purposes. Since the war there has been but little improvement in existing plants, which in the Ural district are dependent upon charcoal as a fuel. Production today has reached about 70 per cent of the pre-war rate.

The contract between the Soviet Government and the American engineering firm is divided into three sections insofar as the expenditure of money is concerned. Construction and equipment of the first units of three new steel plants will cost $150,000,000; in the establishment of colonies and communities at steel mill sites $100,000,000 will be spent, and another $100,000,000 is to be used for the improvement of existing steel plants.

American engineers are to visit Russia and Russian engineers will come to America to study design and operation and to pass upon plans, specifications and drawings for the proposed construction of new plants and rehabilitation of existing steel mills. The Freyn Engineering Co. is to prepare plans for new plants and for the modernization of old plants. It will also prepare all detail drawings, specifications and bills of material on new and old plant work, but the Soviet Government reserves the right to carry out the provisions of this section of the contract should it so desire. The contract also provides that the Freyn company shall oversee plant construction, but this clause is optional, in that the Government may do that work itself. It is further stipulated that the consultant need not supervise construction which it has had no part in designing.

Compensation is based on a sliding scale in accordance with the estimated cost of construction. The contract expires in five years and the Russian Government guarantees for the first three years a minimum compensation based on $42,500,000 worth of consultation work, whether it is actually performed or not. In the event of a dispute the contract provides for arbitration.

Each of three new steel mills now under consideration will have an ultimate capacity of 750,000 tons of ingots yearly. The first plant to be constructed will serve Asiatic Russia and will be built in the Kusnetzky Basin of Siberia. The site was chosen because of nearby deposits of magnetic iron ore and a large field of coking coal. The mill will be located on a branch of the Trans-Siberian Railroad about 1500 miles east of Moscow and 150 miles north of the Chinese frontier. The initial installation calls for two blast furnaces of 700 tons per day each, which is one-half of the projected ultimate capacity.

The second mill is to be in the Magnitnaya district of the Urals, so called for a mountain of magnetic ore. This plant will have the same capacity as the one in the Kusnetzky Basin. The third unit will be located probably at Krivoyrog in southern European Russia, where there are extensive deposits of high-phosphorus ore and an adequate supply of coking coal. Coal of good quality is not available in the Ural district, and it is planned to ship fuel from the Kusnetzky Basin district, a distance of about 1500 miles.

The Russians wish to standardize equipment so far as possible. The three new projects and the rebuilt portions of existing plants will make use of many similar units.

Government development of the iron and steel industry in Russia comes under the control of Glav Metal, a department having supervision over all ferrous and non-ferrous metals. Under the guidance of Glav Metal are trusts, such as the Yugostal or South Russian steel trust. A number of plants may be grouped under a trust, thus forming a Governmental division not unlike a group of privately owned plants in America. Glav Metal is under the supervision of the Council of National Economy, a division in charge of all industry in Russia, which in turn reports to the Council of Peoples' Commissars, a body similar to the American Cabinet.

Coal Stocks for 59 Days' Operation of Steel Plants

WASHINGTON, Aug. 13.—Stocks of bituminous coal at iron and steel plants on July 1 represented 59 days' supplies and, except for April 1, with 73 days' supplies, were the largest for any period since Jan. 1, 1919, the date from which record of stocks has been kept by the Bureau of Mines and Bureau of Census. Stocks at by-product coke plants on July 1 amounted to 40 days' supply, and were the largest at any time during the period mentioned. Consumers' stocks totaled 62,000,000 tons on July 1, a decrease of 13,000,000 tons since April 1, but an increase of 23,000,000 tons over July 1, 1926, a gain of 59 per cent. The figures are interpreted as being a strange commentary on the effectiveness of the strike in the Central competitive field by union miners.

The total supply at the 196 steel works reporting consisted of 1,305,137 tons of gas coal and 2,086,020 tons of steam coal in storage on July 1. Complete returns from by-product coke plants showed a total of 6,731,856 tons of coking coal in stock on July 1. Of this amount, 1,558,385 tons was low-volatile and 5,173,471 tons high-volatile coal.

Record Production of Portland Cement

More Portland cement was produced in July than in any other month on record, according to a statement of the United States Bureau of Mines. The total was 17,398,000 bbl., compared with 17,167,000 bbl. in June, and with 17,134,000 bbl. in July, 1926. The three months just quoted are the only ones in which production has exceeded 17,000,000 bbl. For the seven months a new record was made at 92,374,000 bbl., against 88,958,000 bbl. last year, the previous record, and 88,483,000 bbl. in 1925.

TO DRIVE OUT UNDESIRABLES

Sacco-Vanzetti Demonstrations Cause Labor Department to Ask Industries to Cooperate

WASHINGTON, Aug. 16.—The Sacco-Vanzetti affair has an industrial angle. World-wide demonstrations of sympathizers, professional and otherwise, have attracted attention to the fact that the United States has within its borders many who are hopelessly alien both in a sense of citizenship and feeling. Some are declared anarchists. The demonstrations showed in an unmistakable way that this country has become the harbor of many who have no right in it. The upshot may be further tightening of the immigration laws, and evidently one result will be the deportation of many who have illegally entered the United States.

This is the purpose of Secretary of Labor Davis, who has started a nation-wide round-up of alien anarchists and other undesirables. He has broadcast an appeal which, among other things, asks large industrial plants to cooperate in the effort to drive the undesirables from the country. He has requested them to make a thorough check of employees and to make citizenship or legal entry into the country a necessary qualification for employment. Other Government departments have joined the Department of Labor in its campaign.

It was stated by Mr. Davis that his plan follows one adopted by Henry Ford several months ago calling for credentials proving citizenship or legal entrance to the United States previous to employment in the Ford plant. Secretary Davis said that there are hundreds of thousands of aliens who are known to have entered the United States illegally through "bootleg" channels. He said that many escape the immigration laws under the seaman's act, which permits seamen to remain in the United States 60 days after landing.

There can be no doubt that Sacco-Vanzetti demonstrations have stimulated efforts looking to tighter immigration laws. Secretary Davis for some years has urged a law requiring all aliens to register, but abandoned it in face of opposition in Congress and from other sources. It is said that it is not proposed at present to push the registration plan, but more rigid immigration control is expected to be demanded, as well as a greater staff in the bureau of immigration to watch the American borders.

Michigan Engineers to Inspect Copper Plants

Houghton, Mich., and the copper country are to be visited by the Michigan Engineering Society (E. L. Brandt, executive secretary, 478 West Alexandrine Avenue, Detroit) for a convention on Sept. 5, 6 and 7. Headquarters will be at the administration building at the Michigan College of Mines and Technology. Addresses on the first day will include "Mining in the Lake Superior Copper District," "Concentration and Reclamation" and "Progress in Copper Smelting," followed by colored pictures of the copper country. Inspection of mines, mills and smelters will occupy the second day, with a sight-seeing tour of the copper country on the third day.

American Management Association Forms an Advisory Board

The metal and machinery industries are prominently represented in a group of 41 leading business executives who have organized an advisory board of the American Management Association, feeling that improved management methods are essential in maintaining present prosperity and that knowledge of such methods should be spread more quickly throughout business. On the board of directors are the following:

A. J. Roos, first vice-president and treasurer Diebold Safe & Lock Co.; C. F. Dietz, president Bridgeport Brass Co.; Charles R. Hook, vice-president and general manager American Rolling Mill Co.; Sam A. Lewisohn, vice-president Miami Copper Co.; H. C. Stockham, president Stockham Pipe Fittings Co.; A. T. Simonds, president Simonds Saw & Steel Co.; Edgar S. Bloom, president Western Electric Co.; E. M. Herr, president Westinghouse Electric & Mfg. Co.; M. E. Leeds, president Leeds & Northrup Co.; A. S. Rodgers, president White Sewing Machine Co.; F. A. Scott, president Warner & Swasey Co.; and B. L. Worden, president Cutler-Hammer Mfg. Co.

Both production and distribution will be included in the scope of the board, which will serve in guiding the policies of the association and in focusing its increased research facilities on pressing industrial problems. Among the fields in which new management methods are now being developed and tested by the association and its members are those of labor efficiency and labor relations, financial control and budgeting, sales research and salesmen's training, office management and personnel administration.

Carnegie Steel Co. Disposing of Surplus Land Holdings

The Carnegie Steel Co. is steadily ridding itself of land holdings that have become useless from the viewpoint of integrated plant operations. Recently it sold much of the site of the old by-product plant at Sharon, Pa., to the Sharon Steel Hoop Co., which will use the land for enlarging its rolling mill buildings. It also recently disposed of some land near the plant of the Edgewater Steel Co., Oakmont, Pa., to that company, and it is now reported to be considering a bid from the Baltimore & Ohio Railroad for the Isabella furnace property in Etna, Pa., just outside the Pittsburgh city limits. The railroad wants the land for a freight yard while the Carnegie company has ample blast furnace capacity elsewhere in the Pittsburgh district to produce ferromanganese and spiegeleisen, which these furnaces, when they have been operated, have made.

Starting New Billet and Rod Mills at Worcester

The new billet and rod mill of the American Steel & Wire Co. at the South works of its Worcester, Mass., plant, will be put in operation in September. The Morgan Construction Co. is the builder. The billet mill was given its initial run last week, rolling 4-in. blooms to 2-in. billets. The new plant will have an annual capacity of 100,000 tons of rods. The purpose of the management was not to get an increased tonnage, but to produce economy of operation and at the same time to improve the quality of the product. As soon as the new mill is in operation the No. 2 rod mill at South works will be dismantled and remodeled.

As a part of the steel mill improvements, when they are completed, five steam engines will have been replaced by motors, power for which will be received from the hydro-electric stations of the New England Power Association on the Deerfield and Connecticut Rivers. The only steam engine at South works will be that which drives the blooming mill.

Steam Purifier Interests Combine

Andrews-Bradshaw Co., Pittsburgh, for some time United States sales agent for Tracy Engineering Co., has acquired the entire property and patents of the latter. Tracy Engineering Co. for years has been manufacturing steam purifiers, known under the trade name "Tracyfier," in a plant in San Francisco. Originally designed for marine use, subsequent developments have rendered them adaptable to stationary boilers, which field is now the principal outlet.

The San Francisco factory has been closed and new equipment has been installed in the Pittsburgh factory. George Ahlworth and Carl Petersen, respectively plant superintendent and chief draftsman of the western organization, have moved east to join the Andrews-Bradshaw forces in Pittsburgh. It is planned to continue the research work on the purifier and its applications.

Steel Industry's Great Leader Passes

Death of Elbert H. Gary Ends a Career That Has Contributed More Than Any Other to the Bringing in of a New and Better Era in American Business

BY general acceptance, Elbert H. Gary has been for the greater part of 25 years the foremost figure in American industrial life. The word that early on Monday, Aug. 15, he had died at his home on Fifth Avenue, New York, caused profound regret that was widely felt. Less than four weeks ago was it generally known that Judge Gary was ill, and with the announcement was coupled the expectation that he would return to his office within a week or ten days. The immediate cause of his illness was ptomaine poisoning, but to the surprise of his friends death was attributed to chronic myocarditis. Though the disease had existed for several years, it had not been disclosed even to his intimates.

In making his customary address at the last meeting of the American Iron and Steel Institute in New York on May 20, Judge Gary referred to an injury he had received in a fall in his office. This had caused something of a shock to the nerves and is now thought to have been more serious than it seemed at the time. It is also recalled now that Judge Gary was overcome by faintness in the midst of his presidential address at the institute meeting of May, 1923, and that Mr. Schwab finished the reading.

Eightieth Birthday Tributes

On Oct. 8, 1926, Judge Gary reached his eightieth birthday and on that occasion tribute was paid to him by his friends within and without the steel industry, warm greetings coming from Europe, Japan and other parts of the world. He was much moved by a resolution adopted by the directors of the United States Steel Corporation praising his "great ability, loyalty, respect for the opinions of others, his kindness and tact." The directors of the American Iron and Steel Institute at the same time made an expression of their esteem, which is reproduced below with other tributes.

Probably no career, apart from national official life, has called forth more expressions of high commendation than have appeared in the single day since Judge Gary's passing.

At the annual meeting of the directors of the American Iron and Steel Institute in New York, last May, Judge Gary was again reelected president. Perhaps some misgivings as to his health prompted his statement at that directors' meeting—a statement hitherto unpublished—that he would ask his fellow directors to choose his successor within the year just ahead. Also the thought of eventualities was evidently in his mind at the annual meeting of the stockholders of the Steel Corporation on April 18, when he spoke of his own tenure and of the uncertainty of the future.

As American Iron and Steel Institute President

IN the minds of his contemporaries in the steel trade, most vivid memories of Judge Gary will gather about his long service as president of the American Iron and Steel Institute. Chartered in 1908, as an outgrowth of the Gary dinners, the institute held its first general meeting in New York on Oct. 14, 1910. In 1911 no general meetings were held, but in 1912 and subsequently two general meetings have been held each year, with the single exception of the year 1918, when the October meeting was omitted because of war activities.

Judge Gary has been the one president of the institute and his addresses at the semi-annual meetings have been the outstanding features. Technical papers of a high order have been read, but always the rallying point was the morning session, and always the meeting place was crowded with men from all departments of the industry, from every part of the country, intent on knowing what their leader would say as to the immediate developments in the industry and what might be looked for in the months ahead.

Judge Gary traveled widely, and often at October meetings he gave his impressions of foreign countries he had visited in the summer. He was a great friend of Japan, and the friendships growing out of his visit to that country contributed much to the interpretation of the pacific intent of the American people and their desire to have the good will of the Japanese.

It may fairly be said that Judge Gary's presidential addresses brought many to the New York meetings who but for them would not have made the journey. The president covered a wide range of economic, industrial and civic questions—the relations of the Government to business, the relations of steel companies to labor, the competitive relations of producers of steel, and the problem of legal cooperation to prevent demoralization in the steel market and to protect the interests of stockholders, consumers, workers, and the public. The president's appearance and his taking

up of the gavel were uniformly a signal for warm applause.

The greeting Judge Gary received at the October meeting of 1919 at the Hotel Commodore will long be remembered. He had just returned from Washington where he served as a member of the National Industrial Conference, appointed by President Wilson, in view of the steel strike of 1919. In his address, Judge Gary told of the varying proposals made at Washington by the public group, the employers' group and the union labor group, and of the disagreement that resulted. A feature of the meeting was the presentation to President Gary of a volume, with illuminated text of resolutions adopted by the institute commending Judge Gary's course at Washington, and particularly his "firm stand against any infringement of the rights of the individual in labor or in business, rights fundamental to American industrial supremacy, as well as to American liberty." The resolutions were autographed by all the directors of the institute.

From Lawyer to Industrial Leader

ELBERT HENRY GARY was born on a farm near Wheaton, Ill., Oct. 8, 1846. His parents were of New England stock, his father descending from Massachusetts Puritans and his mother (Susan A. Vallette) from an officer of Lafayette's army. Judge Gary often alluded in recent years to the principles instilled in him by his father and mother. In memory of them, some years ago he built a church at Wheaton, which was presented to the Methodist Episcopal organization in that community. His early education was in the public schools of Wheaton. Later he attended Wheaton College and the University of Chicago, from which he received the degree of LL.B. in 1867. In that year he was admitted to the Illinois bar and in 1882 to the bar of the United States Supreme Court. For three terms he was elected president of the town of Wheaton and when it became an incorporated city he was its first mayor. In 1871 he was taken into a Chicago law firm in which his uncle, Col. Henry F. Vallette, was a partner. After the Chicago fire, in that year, he established his own office, making $2,800 in the first year, more money than he had earned before in his life. In 1882 he was elected county judge of Du Page County, Ill., and served two terms of four years each, but refused reelection. He was president of the Chicago Bar Association in 1891-92.

John W. Gates was the medium of Judge Gary's entrance into the steel business. Mr. Gates was a manufacturer of wire at St. Louis, after having been a very successful salesman for Isaac L. Ellwood, a pioneer in the manufacture of barbed wire fencing. Mr. Gates was arranging to merge his plant with four others. Needing a lawyer he went in 1892 to Judge Gary. The plan was similar to that on which, six years later, the Federal Steel Corporation was organized. The capital was $4,000,000, and the company was known as the Consolidated Steel & Wire Co.

The Wire Consolidation

In the spring of 1898 John W. Gates and Judge Gary had up with J. P. Morgan a proposal to form a consolidation of the wire companies of the country with a capital of $80,000,000. Negotiations were well along and the consolidation was on the eve of being formed when the Maine was blown up in Havana harbor. Financing thus became impossible for the original scheme, but Judge Gary and Mr. Gates, in conjunction with Isaac L. Ellwood, Col. John Lambert and William Edenborn, formed a smaller consolidation which left out the Washburn & Moen and some other interests. The capital was $24,000,000, half preferred and half common, and the company was known as the American Steel & Wire Co. of Illinois.

In October of the same year was formed largely through Judge Gary's efforts the Federal Steel Co., composed of the Illinois Steel Co. (in which Judge Gary and Mr. Gates had previously been associated), the Lorain Steel Co. and the Minnesota Iron Co., the last named having large iron ore properties on the Mesabi and Vermillion ranges of Minnesota. As chairman of the Federal Steel Co. Judge Gary removed from Chicago to New York. This for him was the parting of the ways. He had turned his back on a law practice with an income of more than $75,000 a year to enter a field largely untried and the event was not without some misgivings. Of this turn in his affairs, Ida M. Tarbell writes in her "Life of Elbert H. Gary":

"He was pioneering, taking on a new and uncertain adventure, for there was a possibility of failure, as well as success, in the field he was entering. The possibility was the greater because in this new field a code of ethics was in force which violated in many particulars the code which he had been taught in his youth, and which the experiences of life as a lawyer had convinced him to be the only sound and practical one in human affairs, whatever their nature. The real question at stake in 1898, when Elbert Gary left Chicago and the law for New York and Steel, was what was to become of his code."

Consolidation to Greater Consolidation

The greater wire consolidation, known as the American Steel & Wire Co. of New Jersey, was formed in January, 1899. In February of the same year, under Morgan auspices, the National Tube Co. was launched. In 1900 came what were known as the Moore Brothers group of consolidations—the National Steel Co., composed of various steel companies in the Central West; the American Tin Plate Co., taking in the tin plate manufacturers of the country; the American Sheet Steel Co., the consolidation of sheet rolling mills, and the American Steel Hoop Co.

All these moves emphasized the individual position of the Carnegie Steel Co. Mr. Carnegie constantly held before the steel trade the threat of fresh competition with the consolidations in various finishing lines, particularly in tubes, and in the fall of 1900 rumor was busy with reports of efforts to ally the Carnegie Steel Co. with one and another of the large consolidations of 1899 and 1900. In December, 1900, Charles M. Schwab was the guest of honor at a New York dinner of bankers and his speech on that occasion did much to hasten the formation of the United States Steel Corporation. J. P. Morgan, who sat next to Mr. Schwab at the dinner, went to work at once in conjunction with Judge Gary and others to secure the holdings of Mr. Carnegie and his 36 partners. The "billion dollar" consolidation that had been in the air for several months was consummated on Feb. 25, 1901, and the details of that epochal event are matters of familiar history. Judge Gary became chairman of the corporation and entered upon a quarter century of labors that have made him the outstanding figure in all iron and steel history.

Beginnings of the New Era in Business

HIS biographer tells with much detail of the difficulties Judge Gary encountered in the early days of the Steel Corporation because of the differences between his viewpoint and that of men who belonged to the old school in business. Judge Gary saw sooner than any of his contemporaries that with the formation of great consolidations industry had entered upon an era which emphasized the responsibilities rather than the privileges of captains of industry. Intimations from Washington, during the early presidency of Theodore Roosevelt, that big business needed a house-cleaning provoked resentment from many heads of corporations. Miss Tarbell adds: "I have heard him say that when he came to New York he honestly believed that the public complaint, so loud against certain corporations, was not justified. He did not believe that certain illegalities and immoralities with which they were charged could be practiced. It was only when confronted by actual proofs brought out in one way or another that he became convinced."

In the early meetings of the executive committee of the Steel Corporation there were proposals from certain members that the railroads be encouraged to put up freight rates on iron and steel as high as possible, but at the same time extend offsetting advantages to the Steel Corporation. Judge Gary took the position

that he could not afford to ask a railroad directly or indirectly to discriminate in favor of the corporation.

Favors Publicity for Corporate Acts

He believed also that the various pools in the steel industry should be discontinued. As is well known, he found opposition in his own organization to such discontinuance, but in the end the executive committee ordered that this be done. Mr. Morgan and others in the board of directors were outspoken in their opposition to President Roosevelt's efforts to investigate and supervise industry through the Bureau of Corporations. Judge Gary, on the other hand, favored the development of a policy of publicity in respect to the acts of corporations and cultivated friendly relations with the President. The divergent views found one climax in a resolution offered in the board after the Government had won its suit to compel Mr. Morgan and his associates to retire from the Northern Securities Co. This resolution directed Chairman Gary to make no more visits to the White House and to give out no interviews to the public which had not first been passed on by the finance committee. However, it was not passed. As time went on, his associates came more and more to adopt Judge Gary's position in respect to compliance with Government regulation.

Judge Gary's biographer prints with evident satisfaction the letter Judge Gary wrote on March 15, 1907, to President Roosevelt, saying that, while some of his acquaintances believed the agitation, investigations and prosecutions of the Government tended to depress values and slacken prosperity, he himself believed that sooner or later the results would be beneficial. The friendship of Theodore Roosevelt and Judge Gary was unbroken. In December, 1915, Judge Gary gave a private dinner to the ex-President, attended by the leading financiers of New York.

The Gary Dinners

JUDGE GARY'S early prestige as a leader of the steel industry grew out of the famous Gary dinners. The first of these was given in New York on Nov. 20, 1907, the invited guests being about 30 of the more prominent men in the industry. The panic of 1907 was on and the steel industry was threatened with the demoralization that had come in other years under such conditions. In New York the stampede which brought the Tennessee Coal, Iron & Railroad Co. to the verge of failure was at its worst on Friday, Nov. 1. On Monday, Nov. 4, Judge Gary and Mr. Frick had their interview with President Roosevelt and secured his sanction of the plan by which the Steel Corporation acquired a majority of the capital stock of the Tennessee company.

But the whole steel trade was involved in uncertainty and fear of bankruptcies was widespread. Judge Gary's counsel to the Steel Corporation's competitors, which was given at the first dinner, was thus summarized by Judge J. H. Reed, Pittsburgh, when he was a witness in the Government suit of 1911 for the dissolution of the Steel Corporation: "We must keep our heads, go slow, let jobbers work off their goods, let the country storekeepers get rid of their stocks, take what business naturally comes to us at decent prices, keep our men working. Let us not go out and raid the country, trying to get everything into our own mill, regardless of price."

The Gary dinners were held at intervals over the next two years. The charge of price fixing and destruction of competition was made public from time to time, but Judge Gary said that this had never been aimed at and was not possible unless there could be some form of Government control. Writing to Attorney-General Bonaparte concerning the result of the effort, and speaking for the corporation, he said: "We are perfectly satisfied to limit the amount of our business to our proportionate capacity and to do everything we can to promote the interests of our competitors. By frequent meetings and the interchange of opinions, we have thus far been able to accomplish this result without making any agreements of any kind."

An unusual tribute was paid to Judge Gary in October, 1909, when officers of independent steel companies gave him a dinner to express their appreciation of what he had done in stabilizing the industry, by the introduction of the principle of cooperation.

Later Phases of Judge Gary's Leadership

HIS contribution to the Steel Corporation's defense in the Government suit for its dissolution constitutes by itself a great chapter in Judge Gary's career as the corporation's head. Many able minds cooperated in that defense, but he was its acknowledged organizer. On the witness stand his story of the Steel Corporation's formation, the motives which impelled its organizers and the policies which it had put in force for the betterment of the industry weighed heavily in the scale on the corporation's side.

Deserving another chapter in his biography are all his activities for the betterment of labor conditions—the corporation's activities for the minimizing of accidents, its pension and bonus systems, its work for the upbuilding of steel-making communities in which living conditions were far and away superior to those of pre-Corporation days.

His war-time activities, which were undertaken in response to the Government's request that he head the committee of steel manufacturers to mobilize the industry for the great war effort, would call for a chapter by themselves. Judge Gary's position as the leader of the steel manufacturers in the price-fixing negotiations at Washington was a trying one. More than once the relations of the manufacturers with the War Industries Board seemed at the breaking point. Always there was the possibility that the free hand President Wilson had given Mr. Baruch might have to be invoked, and the whole operation of steel manufacture for war taken over by the Government. Here patience, diplomacy, forbearance and a willingness to go the utmost length, that the demands of bureau heads might be met to the fullest extent, were outstanding.

The six-day week and the eight-hour day were many years in taking their place in the economy of the domestic steel industry. The problem was not simple, and the executives of the Steel Corporation knew that the findings of the Cabot Committee, while they were well supported by public opinion, could not be enforced by a sweeping order. While public opinion was centered on the Steel Corporation, here was a revolution which involved the entire industry and which required time for the winning of all the factors whose cooperation was essential. The intervention of President Harding was no small factor in final elimination of the 12-hour day, but there were also the patience and diplomacy of Chairman Gary and his associates on the steel manufacturers' committee who were the buffer between a critical public and those factors in the industry which are the last to yield to the impact of a new idea.

Tributes of Leaders in the Steel Industry

LARGELY in response to the request of THE IRON AGE, the following expressions have been made by Judge Gary's contemporaries in the steel industry. For the most part the responses are from his fellow directors of the American Iron and Steel Institute. Some members of the board could not be reached, three of them being in foreign countries:

James A. Farrell, President United States Steel Corporation

Judge Gary, his career, his great ability and talents and the preeminent position he had for over a quarter of a century occupied in the steel industry and in the business affairs of the nation are well known to all. He was an outstanding figure, a leader, a constructive statesman in business. But to us within the Steel Corporation's organization who daily came in personal contact with Judge Gary, and who saw his lovable, patient and helpful character, he was not only a friend and guide in our business endeavors, but also in our personal affairs. No problem was too small to command his earnest and careful attention and advice. His judgment was almost unerring, and when a decision was

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Competition for Attention in the Finishing Room

PRACTICALLY every machine part, tool or utensil must have a special finish applied to its surface before it leaves the manufacturer. Possibilities in the finishing departments are almost without limit; close analysis and sound judgment are required to select the process best suited for the work in hand. Many of them are primarily chemical in nature (like Parkerizing) but even so they have no importance apart from the metal industries which use them.

Rust proofing in all its phases, often with the development of a highly polished, beautifully colored surface, is a part of this general field. Aside from its importance to the machinery maker, such processes as cadmium plating, described on page 401 of this issue, should be of interest to manufacturers of various kinds of corrosion-resisting steels, irons and complex alloys, as well as to producers of zinc and nickel, the more conventional plating metals. It is a new method of doing an old thing, a competitor for attention in the finishing departments.

This Issue in Brief

Cadmium plating said to be more even in thickness of deposits, more continuous and freer from capillaries than zinc coating. Cadmium surfaces also tend to hold their silvery white color while sherardizing coats usually turn black with use.—Page 402.

Organized accident prevention has saved lives of 122,764 persons since 1913, according to National Safety Council. This is about equal to deaths in United States armed forces during World War. Accidental deaths in this country from 1913 to 1926, inclusive, totaled 1,146,428.—Page 408.

Continuous unit in gray iron foundry has capacity of 9600 castings per 8-hr. day; approximately 22 tons of metal used. High output in small floor space is made possible, and an unusually large amount of molding sand is handled compared with tonnage of castings produced.—Page 403.

Welds two 72-in. seams on steel sheets at same time. Combined jig and butt-welding machine is said to be largest ever made. Small mandrel and heavy clip may also serve as jig to produce sleeves of accurate dimensions.—Page 403.

Industrial group insurance has expanded from $6,000,000 in 1911 to more than $5,000,000,000 in 1927. Survey shows that such policies now average more than $1000 per person, at a cost of from $10.50 to $12 for each $1000 of life and total disability insurance.—Page 403.

Machine is designed to grind two opposed holes in accurate alinement. Sizing of work is accomplished without plugs, gages or connection with the work, and speed, feeds and truing of wheel are also entirely automatic.—Page 407.

Mold conveyor in continuous foundry unit, instead of having usual cast iron mold carriages, is made of 24 in. x 24 in. steel cars spaced on 27-in. centers and mounted on roller bearings. Conveyor chain is hung in vertical instead of horizontal plane and special caterpillar chain drive is from side rather than beneath.—Page 392.

Careful scheduling of operations and construction program enables steel plant to shift from a 24-in. three-high mill to a 19-in. continuous sheet bar mill with but a 12-day interruption to production. Installation several years ago of new hotbed, bar piler and flying shears, in anticipation of new mill, aided greatly in transfer.—Page 394.

Steel production is at a level which has proved sufficiently low in recent months to allow an adjustment between supply and demand and a renewed expansion of output. Dr. Haney believes usual seasonal expansion may not occur in August, but sees no need for further decline, with likelihood of moderate recovery later.—Page 410.

Blast furnaces and coke ovens should use in their own operations minimum amount of the gas they produce. Authority says largest possible surplus of waste gases or heat should be made available for subsequent steel plant operations if ultimate in fuel economy is to be achieved.—Page 397.

Curtailment in pig iron production not yet sufficient to restore equilibrium to market, says Dr. Haney. July output was more than 7 per cent above estimated normal requirements of country and over 5 per cent above level that would indicate a normal alinement with steel production.—Page 411.

Steel bars containing 0.20 per cent or over of sulphur may develop minute internal cracks during rolling wherever sufficient concentration of sulphur exists. With further rolling these may be greatly extended and lead to dangerous defects not distinguishable by visual inspection.—Page 400.

Plan replacement of tin sheets in canning industry by aluminum sheets. Aluminum Research Institute of Germany finds that contents of can do not affect, and are not affected by, aluminum coating, which is no more expensive.—Page 448.

Secretary of Labor urges industrial plants to cooperate in effort to drive undesirables out of the country. Sacco-Vanzetti demonstrations lead to nation-wide round-up of alien anarchists in desire to avoid labor troubles. Plan follows system begun at Ford plants several months ago.—Page 414.

Shells of large steel oil storage tanks may be constructed of upright taper-rolled plates, shipped from mills and welded to final position with vertical seams on job site. This would save about 20 per cent in total weight of steel used, says Pittsburgh consulting engineer, and would be as satisfactory as old method.—Page 399.

Leaders of nation's steel industry pay tribute to Judge Gary. Directors of American Iron and Steel Institute unite in praise of late Steel Corporation chairman in both business and personal relationships.—Page 415.

American engineering firm to be consultant in $350,000,000 expansion of Soviet steel industry. Three new mills now under consideration will have ultimate annual capacity of 750,000 tons of ingots each.—Page 413.

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Elbert H. Gary

TWENTY-SIX years is not a long span, as human effort is reckoned, yet in that time as head of the United States Steel Corporation, Judge Gary achieved a distinction that is unmatched in the annals of American industry. Within and without the steel trade he is adjudged its greatest leader. Yet he discovered no new processes such as are credited to men whose names head various chapters in the marvelous story of technical progress in steel. Commonly he is credited with doing much to bring in a new era in industry, marked by the principle of cooperation. On a public occasion he defined that principle as "an honest, earnest effort to secure and maintain among business rivals a fair, healthy, vigorous competition and at the same time to oppose and to prevent an unfair, oppressive, cut-throat and destructive competition."

He did not claim to have made any new discovery in ethics; rather, he sought to have others share his faith that the existing code could actually be applied to modern business. Always he affirmed, in defending the aims and practices of the Steel Corporation, that it had never aimed at monopoly, and that its policy in respect to its competitors was summed up in the old-time expression, "Live and let live." In other words, the Steel Corporation's aim as interpreted by Judge Gary was a complete reversal of the policy insistently propagated by Andrew Carnegie, of unrestrained competition and the survival of the fittest.

Judge Gary appreciated sooner than most of his associates in the early years of the Steel Corporation, that the era of consolidations had brought a change in the relations of great corporations and the public. Against the opposition of others on the executive committee of the Steel Corporation, he sustained the policy of President Roosevelt in investigating big business, and frankly told the President that the latter's policies would work out to the benefit of the public and of industry. He recognized that the consolidation regime had imposed a new accountability upon corporations rather than conferring new power.

A genius for apprehending the public's rights, competitors' rights and the just relation of producer to consumer was one of Judge Gary's chief endowments. He was an ideal negotiator, seeking always to get at the viewpoint of the other party to a transaction. This trait accounts in large measure for the composing of differences that seemed for a time to make the formation of the Steel Corporation impossible. And the years since 1901 have brought many issues between the Steel Corporation and its competitors in which Judge Gary's familiar plea for what is "fair and reasonable" has brought peaceable adjustment instead of conflict and retaliation.

His biographer rightly puts a high appraisal upon Judge Gary's contribution to industry in his substitution of balance for instability in American business, "mutual interest for militarism, cooperation for defiance, frankness for secrecy, and good-will for distrust." One of his competitors, in the estimates of his service given elsewhere in this issue, rightly attributes to him the bringing in of a new day by "welding into the structure of business high character, fair dealing and recognition of the interest and rights of the worker, the stockholder and the public at large. Over and above all this, Judge Gary proved the value, soundness and practicability of the large business corporation."

All that has been written in appreciation of Judge Gary's great contribution to the country's material and moral upbuilding is an emphatic tribute to leadership which has behind it the driving power of a high ideal. It is also to the credit of the other leaders in the steel industry—able leaders many of them are—that they have been willing to be led, well led as they have been, and to subordinate personal ambitions that the good of the industry and of the country might be served.

Industrial Activity and Superfluous Labor

IN a well-known financial newspaper we read recently a paragraph, based evidently on Census reports, showing that with reference to 1922 as a base the output of manufactured goods in the United States had increased by 33 per cent in 1925, 37 per cent in 1926 and 38 per cent in 1927 so far.

In the same issue we read another paragraph, also based on data emanating from Washington, to the effect that in most parts of the country the supply of labor is overplentiful, and that taking the country as a whole there are about 138 applicants per 100 jobs available.

These statements might be regarded as contradictory, one indicating increased manufacturing activity, the other increased unemployment; but really they are not so, for such a discrepancy is capable of explanation that is economically important.

In the first place, however, we must express reserve in respect to the well-meant efforts of the Census Bureau. Its monthly accounting of manufacture is by no means complete, and it may be that grand totals would figure to different percentages than partial totals, owing to switching from one kind of manufacture to another. For example, if automobile tires were counted and horsehoes were not. Moreover, 1922 is an unfortunate year to be taken as the basis of measurement, remembering that the great post-war depression extended well into it.

Nevertheless, we may recognize an increasing rate of manufacture during the last three years, which may or may not have been expanding more rapidly than the increase of population. We may further acknowledge a tendency toward economy of labor in manufacture, which in itself would release workers.

A recent article in the *Annalist* pointed out that the difference between the estimated national income and the total of goods and services that can be actually enumerated as a part of it has been steadily increasing, suggesting that the portion of the national income derived from sundry services has been increasing. Another way of putting this is that the number of workers in agriculture, mining, manufacturing and steam railroad transportation is statistically known not to have increased, leading to the deduction that the addition to supply resulting from growing population has found occupation in other ways. It is not at all probable that such absorption has occurred in building houses, but it is likely that there has been more or less in the making of roads, for which payment comes out of taxes shouldered by other producers.

Besides the influx of available labor resulting from increasing population, release from manufacture, transportation, etc., there is that which comes from over-manned and unprofitable industries that must purge themselves. Bituminous coal mining, for example, could not indefinitely support 200,000 superfluous miners. Nor could agriculture maintain a far greater number of unnecessary workers, whose own inefficiency put them in the way of starving to death. Especially in the South, from all accounts, has unproductiveness per man been disastrous.

In our present economic situation increasing unemployment does not therefore signalize the approach of depression. It rather reflects maladjustment and leads to fancies of the enormous extent to which our national income might be swelled if all available labor could be got to work in useful ways.

More Scrap in Steel Making

COMMENT has frequently been made of late that the world is making much more steel relative to pig iron than formerly. But some of the comment wrongly attributes much of the change shown by the statistics to the swing from the iron casting to steel, for the "steel" figures regularly taken are those of ingot production, not of finished rolled steel. In rolling there is much scrap produced, chiefly by cropping, and the scrap goes to the open-hearth, being weighed a second time in the ingot form.

There has been, however, a large increase in the use of scrap in steel making, apart from the scrap which the steel plant itself produces. The growth of such consumption in the United States can readily be measured. The production of steel making pig iron, not of all pig iron, may be compared with the production of finished rolled steel, not the production of ingots, plus the production of steel castings. The computation is not exact for various reasons, including the fact that a little tonnage of steel-making pig iron is used in foundry work, but in a comparison of one period with another such points are practically balanced.

In 1912 and 1913, the two greatest steel years before the war, steel making pig iron, Bessemer and basic, plus ferromanganese and spiegeleisen, exceeded the rolled steel plus steel castings by about 225,000 tons a year or by a trifle under 1 per cent. In 1926 the pig iron, etc., fell short of the steel by 4,570,000 tons or by 12.6 per cent, showing what a change occurred.

One may assume roughly that 5 per cent of the weight of pig iron, in carbon, silicon, etc., disappears. Deducting this, one finds that in 1912 and 1913 there was about a million tons a year more steel than the actual iron furnished by the pig iron. A similar computation for 1926 shows about 6,150,000 tons. Roughly speaking, these quantities, 1,000,000 tons before the war and 6,000,000 tons last year, represent the scrap used by steel works outside of the scrap they themselves produced between the ingot and the material in the form in which it was weighed to furnish the official statistics of "finished rolled steel."

This steel itself produced some scrap in the works, for it included such items as skelp and wire rods, which are further worked in the mill. There was also some industrial scrap, produced in fabricating or working up steel elsewhere; but the great bulk of the 6,000,000 tons was old material, which had gone through a period of service. The actual tonnages were probably greater than the 1,000,000 tons and 6,000,000 tons shown by this computation, but the comparison showing the growth in 13 or 14 years is substantially exact.

It should be noted that the quality of scrap used in the open-hearth furnace has greatly improved. As time passes old material in larger form comes out, growing less and less miscellaneous, while

there is steady improvement in grading and sorting whereby the charge can be made up of suitable proportions.

While there has been this growth in the tonnage of outside scrap used, the proportion to pig iron cannot increase indefinitely, for some steel never comes back. Even with stationary steel production, which is altogether improbable, it would still be necessary to take much iron ore out of the ground.

OF present conditions in British foreign trade in iron and steel the London *Iron and Coal Trades Review* has this to say:

> For some time our imports have been on such a scale as to cause serious concern not only to steel makers but also to the Government.

In 1926, the period of the great coal strike, British iron and steel imports reached the largest volume in many years at 311,700 gross tons per month, or 3,740,400 tons. The maximum before the war was 2,230,955 tons, or 185,900 tons per month. This year, the momentum gathered in 1926 has continued and increased and in the six months ended June 30 a total of 2,570,200 tons was reached, or 428,400 tons per month, an increase of about 37 per cent over the high rate of 1926. The editorial from which the above expression is taken further remarks that French material is causing the greatest inroads on the British market. Lower wages, longer hours, lower capital charges and a protected home market are named as the main factors favoring Continental producers. Despite the fact that the British steel industry is able to produce steel at its normal volume and has been making both pig iron and steel at a rate exceeding that of 1925, the problem of competition with Continental countries is one of increasing gravity.

Steel Industry's Great Leader Passes

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reached on any major issue, he was unfaltering in maintaining it.

Judge Gary will be greatly missed in our organization and in the steel industry and among his business associates and friends, but he has builded well and his constructive ideas and principles of business conduct will maintain to his great credit and honor. He has left behind him a most efficient organization thoroughly capable of carrying on the affairs of the Steel Corporation, which he so long directed.

Charles M. Schwab, Chairman Bethlehem Steel Corporation

Judge Gary will go down in industrial history as one of the greatest figures in America. His management of the Steel Corporation was unparalleled. His work of devotion to the Iron and Steel Institute, which he originated, was of incalculable benefit to the industry. He was a great man, and his many friends and associates will miss his advice and counsel.

James A. Campbell, President Youngstown Sheet & Tube Co.

The death of Judge Gary will be a great loss to the steel industry. His integrity and ability were demonstrated first to many of us in 1907 when he called a meeting of the leaders in the steel industry and established cooperation and friendships without interfering with competition and undoubtedly saved many concerns from bankruptcy. His loyalty and leadership during the World War, which required both judgment and tact, was of great help to our country and its allies in winning the war. He founded the American Iron and Steel Institute which has done much to create good feeling within and without the industry. His outstanding monument will be the United States Steel Corporation which he so ably directed. He was a great leader and his ability and advice, his fairness and personality, will be greatly missed in the steel industry and all circles in which he was active.

Horace D. Wilkinson, Chairman Crucible Steel Co. of America

It is with deep regret that I learn of the death of Judge Gary. I know of no one whose death will seem such a great loss, not only to the country at large but especially to those interested in the steel and iron industry.

Judge Gary stood practically alone in his advocacy of a policy of helpfulness and fairness in competition to all others concerned in the steel industry. It was his desire that all of the competitors of the great company he represented should have their fair share of the business, and he believed that prosperity should come to all alike, both great and small.

His guiding hand will undoubtedly be missed by every one connected with the various interests which received his time and attention. He was always kind and courteous to every one and won the hearts of all those who came in contact with him. He assisted in building up a strong organization about him and his policies and influence will undoubtedly be carried on to even greater success by those who are to succeed him.

Severn P. Ker, President Sharon Steel Hoop Co.

The steel industry has lost its acknowledged leader of the past quarter century, whose influence during all that time has been constructive and helpful. The present high standard of corporate management, the relations existing between competitors, between capital and labor, and between these interests and the general public are undoubtedly due largely to Judge Gary's influence. He was a great organizer and his superb handling of the affairs of the corporation was of benefit not only to the corporation and to the steel industry but to the nation.

Joseph G. Butler, Jr., Youngstown, Ohio

The death of Judge Gary is a distinct loss to the entire world. I regard him as one of the great men of the present century. His steady poise, his vision of the future and his untiring industry all combined to place him in the front rank of patriotic Americans as a leader trying to better the condition of his fellow men. His policies will be perpetuated and the United States Steel Corporation will continue to lead the steel industry of the world. The corporation has a staunch board of directors of high ability and the subsidiary companies are thoroughly well organized. The country will continue to prosper under the lead of the United States Steel Corporation.

Willis L. King, Vice-President Jones & Laughlin Steel Corporation

I knew of Judge Gary's recent illness but supposed it was nothing serious, and am therefore greatly shocked to learn of his death. He possessed all the qualities of a great leader, and would have been preeminent in any sphere of endeavor. I have known and admired him for many years. His personality, ability and fairness have endeared him to his friends and business associates and held the respect and confidence of the public. The great company of which he was the genius and directing head since its organization has suffered a most serious loss and the steel industry a great leader and counsellor. I am at a loss for words to express my feelings of personal sorrow in his death and my regret for the break in a friendship of many

years during which I learned to know and esteem his many great and lovable qualities.

Eugene G. Grace, President Bethlehem Steel Corporation

In Judge Gary's death the steel industry loses its most able leader and wisest counsellor. The American Iron and Steel Institute was of his creation, and through it he devoted himself with great earnestness and wisdom to the improvement of conditions throughout the iron and steel industry. He will be greatly missed by his friends and associates, of whom he was always most considerate.

Alva C. Dinkey, President Midvale Co.

The death of Judge Gary marks an epoch in the iron and steel industry of the United States. Broadly speaking, he has been continuously at the helm during the period when the greatest changes in factories, plants and methods have taken place. His has been the guiding hand in the changing business practices which the properties under his control required and which the spirit of the times demanded. Whether he was greatest as an administrator or as an advocate of fair dealing between the public, the employee and the stockholder cannot be told at this time. One of the giants of iron and steel has left us.

Ross H. McMaster, President Steel Co. of Canada

The steel industry will ever remain deeply indebted to Judge Gary for his able guidance and counsel over the many years he dignified the position of president of the American Iron and Steel Institute. His leadership was synonymous with the highest principles and with everything that was sound and broad and fair to everyone concerned and connected with the industry. In his capacity as chairman of the United States Steel Corporation, besides the outstanding success of his administration, he has done more than any other influence to convince public thought of the sincerity of the principles which guide large corporations and to establish the fact that social and economic advantages may both be served by such companies to the public benefit. He was an industrial leader of world-wide prominence, possessing outstanding ability and character, and his memory and influence should be lasting.

J. F. Welborn, President Colorado Fuel & Iron Co.

Judge Gary was without question one of the outstanding men of his day. In force of character and personality he was extraordinary. Passing over his marvelous executive ability, which brought about the development of the Steel Corporation, his policy of fairness in all business relationships was particularly impressive to those of us who are associated with competing companies, as it must have been to all others who became acquainted with his high ideals.

George M. Verity, President American Rolling Mill Co.

Judge Gary's sudden taking away must come as a great shock to the steel industry of the world. His position as the outstanding industrial leader of his time has been firmly established. He brought about a new day in industry through welding into the structure of business high character, fair dealing, and recognition of the interest and rights of the worker, the stockholder and the public at large. Over and above all this, Judge Gary proved the value, soundness and practicability of the large business corporation. His life and work will stand as a monument to the higher standards of modern business now established and will be a guidepost to all future business enterprise.

Thomas Cantley, Nova Scotia Steel & Coal Co.

In the passing of Judge Gary the United States has lost one of the greatest industrial leaders, whose farseeing, constructive policies, coupled with judgment and conservative administration, added greatly to the success of the corporation of which he was so long the unchallenged as well as the titular head. His fairness in business, his transparent honesty, his courtesy toward competitors won him the friendship of all who were privileged to know and associate with him. The sales policy of the Steel Corporation, in the writer's judgment, under his administration over a period of years, did more to stabilize the iron and steel business of the United States, and to no small extent in Canada also, than any other agency private or public on this continent. As the president of the American Iron and Steel Institute his influence was continent-wide, and those of us who for years had the privilege of sitting with him at the regular monthly meetings of the directors of the institute learned much as to the paramount and underlying principles on which his business and his private actions were based. Fair, generous, appreciative of the work and merit of others, modest and wise, his corporation and his country have in his passing lost much, his friends most of all.

S. E. Hackett, Vice-President Jones & Laughlin Steel Corporation

Judge Gary's record of accomplishments during the past 25 years as directing head of the Steel Corporation, his constant support of the principles involved in fair dealing, and his great interest in civic affairs and the every-day problems of life all speak for themselves.

E. A. S. Clarke, Secretary American Iron and Steel Institute

On the occasion of Judge Gary's eightieth birthday, Mr. Clarke wrote this greeting, which was adopted as the sentiment of the directors of the American Iron and Steel Institute:

"We, the directors of the American Iron and Steel Institute, extend to you on this your eightieth birthday anniversary our sincere, affectionate congratulations and good wishes.

"Since the creation of the institute, which was inspired by your efforts to stabilize the iron and steel industry at a time of great financial stress, you have been its wise, far seeing, able leader. Your vision, your wise counsel and your fearless stand for fair treatment and consideration of the rights of others have been of the greatest value to the industry, to our country during the Great War, and to the American people.

"May you be spared for many years, in health and vigor, to continue to guide us."

Arrangements for the Funeral

INTERMENT was at Wheaton, Ill. The chief officials of the corporation and a number of executive officers of the subsidiary companies left New York Tuesday afternoon, on the special funeral train, run as the first division of the regular 20-hr. Chicago train. Included were James A. Farrell, Hon. Nathan L. Miller, D. G. Kerr, John Hulst, John Hughes, George K. Leet, Gordon L. Edwards, E. P. Thomas, J. A. Hatfield, J. B. Carse, C. L. Close, F. R. Sites, K. B. Halstead, W. A. Brown and C. S. Bellsterling, and also E. A. S. Clarke, secretary American Iron and Steel Institute. Others left directly from their headquarters in other cities.

The honorary pallbearers were as follows:

George F. Baker, Jr., John H. Batten, E. A. S. Clarke, Hiram S. Cody, Gen. Charles G. Dawes, Senator Charles A. Deneen, Bernard Eckhart, J. A. Farrell, W. J. Filbert, A. W. Harris, Hon. Jesse E. Holdom, Marvin Hughitt, Sr., D. G. Kerr, George K. Leet, Gov. Hon. Frank O. Lowden, Hon. Nathan L. Miller, John J. Mitchell, Junius S. Morgan, Hon. Lewis Nixon, Alexander H. Revell, George M. Reynolds, Julius Rosenwald and Dr. Walter Dill Scott.

A Flood of Letters of Condolence

By Tuesday afternoon a continuous stream of letters and telegrams was flowing into the offices of the Steel Corporation in New York. Among others were cables of condolences from August Thyssen, in Brussels; Sir Robert A. Hadfield, London; W. P. Curley and W. C. Downs, of the Companhia Meridional de Mineracao, at Rio de Janeiro; John A. Topping, at Edinburgh; Hugo Stinnes, Jr., and Erich Will, Berlin; A. D. Allan, McAlister Co., London; Arthur Dorman, Middlesbrough; Percival Roberts, from the steamship Aquitania, and Sir William Peat, London.

The Steel Corporation mills will be closed down for five minutes, that is, from 10.30 to 10.35 a. m., daylight saving time, Thursday, as a tribute to Judge Gary.

Iron and Steel Markets

Steel Demand Remains Steady

Substantially No Change in Rate of Operations—Structural Steel Inquiries Notable—Good Buying of Pig Iron—Further Advances in Scrap

CONDITIONS in the steel trade are substantially unchanged from last week. Demand remains steady in most lines, and the total volume of specifying has kept August operations so far slightly above those of July.

With buyers concerned chiefly about supplies for their definite immediate needs, prices are not under special attack, and the present state of low consumption, with only seasonal prospects for an increase in sight, serves to strengthen the price stand of producers, on the score that concessions would be of little avail.

Heavy tonnage orders are infrequent, and it is the general run of small purchases from manufacturing consumers that is the main dependence of the mills. Short time shut-downs are still common, to accumulate the quantities that make for economical production. Prompt delivery is possible in practically all lines.

The general construction industry alone continues to develop important tonnages. Automobile makers still are moving cautiously, expectations from the railroads are not of early promise, and the oil industry is wrestling with the problems of over-production. Agricultural demand has put harvesting machinery and tractor plants close to a capacity basis but there is a lagging in tillage lines.

In structural steel, fabricators are finding the shape mills less willing to help by concessions in the speculative bidding lately rampant in the building trade. Signs point to a closer approach toward equilibrium in plain material prices through fewer extreme low quotations in the East and a $2 a ton differential between Pittsburgh and Chicago prices.

Bids will soon be taken on about 150,000 tons of steel for the new Hudson River bridge, New York. Additional structural steel inquiries amount to 33,400 tons, including 5300 tons for a club building in New York, 6000 tons for a hotel in Chicago and 4000 tons for a bridge over the Ohio River at Paducah, Ky. Bookings of 27,000 tons for the week are headed by 6000 tons for a section of the Broad Street subway, Philadelphia.

Production of steel bars is held closely to demand. In the Chicago district, new buying dropped below the volume of last week but specifications were steady and for four consecutive weeks have exceeded shipments. The takings of such important consumers as the makers of cold-finished bars and bolts, nuts and rivets are notably small.

Specifications of alloy steel bars are growing and production is at a 70 to 75 per cent capacity rate.

Sheet mill activity illustrates the periodic fluctuations in output characteristic of a quiet market. In the Youngstown district 86 units were in operation against 94 last week and 72 the week preceding. Sales in July by the independent sheet makers of 230,715 tons were better by 6000 tons than those of June. Shipments, at 252,000 tons, which thus exceeded orders by some 21,000 tons, reduced unfilled obligations by 46,000 tons.

In wire products, while specifications and fresh purchases by manufacturing consumers approximate the July rate of consumption, jobbers are believed to have stocks sufficient to satisfy late summer distribution needs.

Pig iron sales by Cleveland producers amounted to 50,000 tons for the week, while furnaces at Buffalo and along the Eastern seaboard sold a total of 55,000 tons, much of it for delivery through the rest of the year. The low level of prices and the lack of further declines have accounted for some of the buying. At Chicago, where furnaces booked 40,000 tons for the third consecutive week, the current buying movement is characterized as belated contracting, following the exhaustion of stocks carried over from the second quarter.

Steel foundry operations in the Pittsburgh district average only 50 per cent of capacity, with plants serving the railroads running at less than that rate. The slowing up of home building is adversely affecting the output of radiators and sanitary ware.

A contract for 15,000 tons of furnace coke a month, to run through the remainder of the year, has been placed by a Buffalo pig iron producer at a reported price of $3.25 per net ton, Connellsville. The fuel market is being favorably affected by a fairly strong call for heating coke and a seasonal gain in the demand for domestic coal.

Heavy melting steel scrap at Philadelphia has advanced 50c. a ton for the second time in two weeks. Increases of 50c. a ton at Cincinnati and 25c. a ton at Pittsburgh and St. Louis are also reported, dealers doing more to support the market than consumers. At Cleveland, prices are weakening, and at Chicago, where steel plants are holding up scrap shipments, some grades have declined. THE IRON AGE average of heavy melting steel is now $14 compared with the low of the year, on July 19, of $13.33.

Shapes and plates have been advanced $1 and $2 a ton, respectively, on the Pacific Coast, following the advance of $3 a ton in the freight rate effective Aug. 1 on shipments from the Atlantic Coast via the Panama Canal.

THE IRON AGE composite prices remain unchanged, that for pig iron duplicating last week's low of $18.13, while that for finished steel remains for the tenth week at 2.367c. a lb.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron Per Gross Ton:	Aug. 16, 1927	Aug. 9, 1927	July 19, 1927	Aug. 17, 1926
No. 2, fdy., Philadelphia	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace	17.50	17.50	18.00	17.50
No. 2, Southern, Cin'ti	20.94	20.94	20.94	24.19
No. 2, Birmingham	17.25	17.25	17.25	21.00
No. 2 foundry, Chicago*	19.50	19.50	20.00	21.00
Basic, del'd eastern Pa	20.00	20.00	20.75	21.00
Basic, Valley furnace	17.25	17.25	17.50	17.50
Valley Bessemer, del'd P'gh	20.26	20.26	20.26	19.76
Malleable, Chicago*	19.50	19.50	20.00	21.00
Malleable, Valley	17.50	17.50	18.00	17.50
Gray forge, Pittsburgh	18.76	18.76	19.26	18.76
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	90.00	90.00	90.00	88.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	36.00
Forging billets, P'gh	39.00	39.00	39.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh	43.00	43.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.80	1.80	1.80	2.00
Steel bars, Chicago	2.00	2.00	2.00	2.10
Steel bars, New York	2.14	2.14	2.14	2.34
Tank plates, Pittsburgh	1.80	1.80	1.80	1.90
Tank plates, Chicago	2.00	2.00	2.00	2.10
Tank plates, New York	2.09	2.09	2.09	2.24
Beams, Pittsburgh	1.80	1.80	1.80	2.00
Beams, Chicago	*1.90*	2.00	2.00	2.10
Beams, New York	1.95	1.95	2.04	2.34
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Aug. 16, 1927	Aug. 9, 1927	July 19, 1927	Aug. 17, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	2.95
Sheets, black, No. 24, Chicago dist. mill	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	3.80
Sheets, galv., No. 24, Chicago dist. mill	3.95	3.95	3.95	3.95
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh	2.55	2.55	2.55	2.65
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.25	3.25	3.25	3.35
Barbed wire, galv., Chicago dist. mill	3.30	3.30	3.30	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	**$15.50**	$15.25	$15.00	$17.50
Heavy melting steel, Phila.	**14.00**	13.50	13.00	16.00
Heavy melting steel, Ch'go	12.50	12.50	12.00	14.00
Carwheels, Chicago	14.50	14.50	13.50	16.00
Carwheels, Philadelphia	**15.50**	15.00	15.00	17.50
No. 1 cast, Pittsburgh	15.00	15.00	15.00	17.00
No. 1 cast, Philadelphia	16.00	16.00	16.00	17.50
No. 1 cast, Ch'go (net ton)	*14.75*	15.00	14.50	17.00
No. 1 RR. wrot, Phila.	15.50	15.50	15.50	18.00
No. 1 RR. wrot, Ch'go (net)	*11.50*	12.00	11.50	13.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$2.90
Foundry coke, prompt	4.00	4.00	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.50	13.50	12.75	14.50
Electrolytic copper, refinery	*13.00*	13.12½	12.50	14.25
Zinc, St. Louis	**6.37½**	6.32½	6.17½	7.30
Zinc, New York	**6.72½**	6.67½	6.52½	7.65
Lead, St. Louis	*6.40*	6.52½	5.95	8.80
Lead, New York	6.75	6.80	6.20	8.90
Tin (Straits), New York	*64.37½*	65.12½	63.75	64.75
Antimony (Asiatic), N. Y.	12.00	12.00	11.50	16.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Demand Marks Time—More Activity in Scrap and Fuel

PITTSBURGH, Aug. 16.—No perceptible change is observed in the rate of steel ingot production in this and nearby districts, but incoming business shows a slight, but distinct, loss as compared with last week, and it is evident that summer lethargy has not yet disappeared from the market. Demand for wire products has fallen off, and the effect of curtailed packing of fruits and vegetables is plainly reflected in the demand for tin plate. At this time last year there was a demand for the latter sufficient to sustain mill operations at between 85 and 90 per cent of capacity, while present engagement of such capacity is about 20 points lower.

Supplementary 1927 rail business appears to have been all closed, and it is early for contracting for next year's requirements. Indeed, railroad buying generally is light, and the recession in car loadings, to say nothing of decreasing earnings, is causing some revision of expectations as to steel business from the carriers. All of the new models of automobiles have not yet been shown, and current interest is reflected in curiosity rather than sales. Certainly, there has been no increase in the demand for automobile steel that would suggest increased motor car production in the next few weeks. The oil industry is still engaged in correcting overproduction, and drill and drive pipe and casing remain dull. The crop outlook is promising this year, but there is not much evidence in the steel market that the farmers are beginning to discount their larger returns.

Steel ingot production for the Pittsburgh district is not far from 70 per cent of capacity, but output in the Youngstown district is not averaging more than 60 per cent and, taking Wheeling and Johnstown into the compilation, the general average of the combined areas is not over 65 per cent.

Prices generally are holding well. That is usually the case when buyers are more concerned about getting needed supplies promptly than in prices, while manufacturers realize that concessions at this stage would not increase the size of the commitments.

While the steel market is quiet, pig iron really is dull. There has been some break in the dullness in scrap, however, with one sale of approximately 10,000 tons of heavy melting steel to a Pittsburgh district steel maker, and the coke market has been slightly enlivened by the closing of a contract to run over the remainder of the year, calling for 15,000 tons a month. Domestic requirements are responsible for a slightly better tone in the coal market.

Pig Iron.—The recent decline in prices has made buyers even more cautious, and a written inquiry has become a rarity. Solicitation does not produce much business, and it is evident that melters have ample supplies or coverage for their present requirements. Generally steel foundries in this district are not operating at more than 50 per cent of capacity, with those serving the railroads not doing even that well. Jobbing foundries are far from active, and the slowing up in new home building is affecting the output of the sanitary ware and radiator manufacturers. Sales of foun-

dry iron still run chiefly to carload lots. There is almost no interest in basic iron, and reported sales of Bessemer iron amount to only 500 tons.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.25 to $17.50
Bessemer	18.50
Gray forge	17.00 to 17.50
No. 2 foundry	17.50 to 18.00
No. 3 foundry	17.00 to 17.50
Malleable	17.50 to 18.00
Low phosphorus, copper free	27.50 to 28.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Bars, Plates and Shapes.—No betterment is noted in the demand for bars, which feels the effect of the low rate of operations among such important consumers as makers of cold-finished bars and bolts, nuts and rivets. Ordinary tonnages down to single carloads are now being placed without difficulty at 1.80c., base Pittsburgh. Plates are not moving with much freedom, and 1.80c., base Pittsburgh, is all that can be obtained for small lots. Structural steel fabricators are experiencing slow business, and plain material is not so actively sought as a few weeks ago. In the Pittsburgh district the mills are still asking 1.80c., base, and getting that price for small tonnages, but for the larger projects, particularly those away from this center, the price must be made to fit the successful fabricator's bid.

Bolts, Nuts and Rivets.—New business is rather slow in keeping with conditions in the leading consuming industries, but there is no weakening of prices and concessions that a few makers are giving are having no effect upon the general market.

Ferroalloys.—The market is still dull in point of new sales and is hardly active so far as specifications on contracts are concerned, since some important consumers of ferromanganese, spiegeleisen and high grade ferrosilicon are ordering in shipments in keeping with their present requirements. Steel ingot production in this and nearby districts is between 60 and 70 per cent of capacity, and conservative ordering of ferroalloys is also encouraged by the fact that consumers do not expect any difficulty in getting heavier shipments when their requirements warrant them. Prices are steady.

Semi-Finished Steel.—There is no apparent improvement in business; indeed, on account of the comparatively low rate of sheet, tin plate and strip mill operations the common report is that specifications against contracts are hard to obtain. There is no new business in billets, slabs and sheet bars, and little new demand for wire rods, since users are amply covered against their requirements for this quarter and have not had demands that necessitate supplementary purchases. Recent prices are holding.

Wire Products.—Trading is only moderately active and, if anything, somewhat smaller in volume than recently. Dullness is common to this time of the year, and does not stimulate manufacturers to extra sales effort. There is close observance of quotations on new business, but not enough demand of that sort to provide a real test.

Rails and Track Supplies.—Demand for rails, both standard and light section, is moderate in this market, and local makers of track accessories still admit that there is room for considerable improvement in business. Rail prices are firm, and there is no tendency by producers to shade prices of the accessories, since it is believed lower prices would not bring out orders.

Tubular Goods.—Butt welded pipe is moving very steadily, and makers expect orders to expand in the next few weeks, when jobbers will begin to feel the fall demands for heating equipment. Lapwelded pipe, particularly in the oil well sizes, is still slow, and is expected to remain so for the remainder of the year, since few expect that overproduction of oil can be corrected before the first of 1928. Line pipe is moving fairly well in the small sizes, and makers of large outside diameter pipe are not entirely out of orders. Some improvement is noted in merchant boiler tube business, and the movement of mechanical tubing and tubing for automobile bumpers is fairly satisfactory.

Sheets.—The situation is still more interesting from the price than the business angle. Demand is steady enough, and some makers note a definite gain in the past week's specifications, but orders and specifications generally are for small lots for prompt shipment and an engagement of only 70 to 75 per cent of capacity is necessary to meet tonnage and shipment requirements. It is not so long ago that a market of the present proportions and characteristics could be counted on to induce price concessions by mills needing orders, but if there are makers that now need business it is not apparent in prices, because deviations from quotations are remarkably few, and then of very small amounts.

Tin Plate.—The market continues slow. There is little or no new business, and there is almost no pressure for deliveries against contracts for the last half of the year, which, it develops, were considerably smaller than those for the same period last year. Late reports indicate some increase in the pack of tomatoes as compared with last year, which was an off year in that vegetable, but reliable estimates indicate that the total pack of peas, corn, tomatoes and peaches will run from 20 to 25 per cent under that of 1926. Present tin mill operations of between 65 and 70 per cent of capacity compare with from 85 to 90 per cent at this time last year, when a comparatively strong domestic demand for packers' can sizes was supplemented by considerable export business.

Cold-Finished Steel Bars and Shafting.—Automobile parts makers, who constitute the principal outlet for cold-finished steel bars, are still ordering conservatively, and while fairly good demands are coming from other consuming industries, total business falls short of mill capacity. Prices show irregularity, with some makers still anxious enough for orders to go under 2.30c., base Pittsburgh, for small lots.

The Iron Age Composite Prices

Finished Steel

Aug. 16, 1927, 2.367c. a Lb.

One week ago	2.367c.
One month ago	2.367c.
One year ago	2.431c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.339c.,	April 26
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Aug. 16, 1927, $18.13 a Gross Ton

One week ago	$18.13
One month ago	18.50
One year ago	19.46
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.13,	Aug. 9
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
Del'd Cleveland	1.99c.
F.o.b. Cleveland	1.80c. to 1.85c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.

Rail Steel

F.o.b. mill	1.65c. to 1.80c.
F.o.b. Chicago	1.90c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.80c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.07c. to 2.12c.
Del'd New York	2.09c. to 2.14c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.80c.
F.o.b. Chicago	1.90c. to 2.00c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	1.90c. to 2.02c.
Del'd New York	1.90c. to 2.04c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.30c.
All gages, 6 in. to 12 in., P'gh	*2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net	2.40c.
All gages, narrower than 6 in., Chicago,	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago,	2.20c. to 2.50c.
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Atlantic ports	$1.21
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Gulf ports	$1.20

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c. to 2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.30c. to 2.35c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., f.o.b. P'gh mill	3.25c.
Strips, under 12 in., f.o.b. Cleveland mills	3.25c.
Strips, under 12 in., delivered Chicago	3.55c.
Strips, under 12 in., f.o.b. Worcester mill	3.40c.
Stripsheets, 12 in. and wider, Pittsburgh mill	3.00c.
Stripsheets, 12 in. and wider, Cleveland mill	3.00c.
Stripsheets, 12 in. and wider, del'd Chicago	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55
	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.25
Barbed wire, painted	3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.35c.
Nos. 9 and 10, del'd Philadelphia	2.57c.
Nos. 9 and 10, f.o.b. Birmingham	2.40c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	3.00c.
No. 24, f.o.b. Ch'go dist. mill	3.10c.
No. 24, del'd Philadelphia	3.32c.
No. 24, f.o.b. Birmingham	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.15c.
No. 24, f.o.b. Pittsburgh, B grade	3.95c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.85c.
No. 24, f.o.b. Chicago dist. mill	3.95c.
No. 24, del'd Philadelphia	4.17c.
No. 24, f.o.b. Birmingham	4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.25c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.20c. to 4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C. $11.40	25-lb. coating I.C. $17.30
15-lb. coating I.C. 14.45	30-lb. coating I.C. 18.75
20-lb. coating I.C. 15.80	40-lb. coating I.C. 20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.10 to 4.20
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.10 to 3.20
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.10 to 3.20
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.10 to 4.30
6100	(Chrom. Vanad. spring steel)	3.60 to 3.80
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.20 to 3.30
	Chromium Molybdenum spring steel (1 — 1.25 Chrom., 0.30 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅜ in. and larger	$2.80 to $2.90
Spikes, ½ in. and smaller	2.80 to 3.00
Spikes, boat and barge	3.10
Tie plates, steel	2.35
Angle bars	2.75
Track bolts, ⅞ in. and ⅞ in.	3.90
Track bolts, ¾ in. and smaller, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	56	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	58	45½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	⅛ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1¼	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
2¾ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	56	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled			
2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 12 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb.	2.90
Wire, galvanized soft, base per 100 lb	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Hoops, Bands and Strips.—New business in strips, both hot and cold-rolled, is light, as many consumers appear to have some of stock still on hand that they ordered out just before the end of the second quarter, and others are ordering in strict accordance with actual and immediate requirements. Not much activity is noted in hoops and bands, and cotton ties for this year have been largely made and shipped. Strip, hoop and band prices are all firmly maintained.

Coke and Coal.—A Buffalo district pig iron producer has placed a contract for 15,000 tons of furnace coke a month to run over the remainder of the year and is understood to have paid $3.25 per net ton at Connellsville ovens. The spot furnace coke market is dull, but the offerings are moderate and prices generally have been favorably affected by a fairly strong demand for heating coke, which is pushing up quotations on that grade. Spot foundry coke is firm, as production is not much in excess of contract requirements and there is some demand for spot tonnages for stocking. The coal market is slightly more active and a shade firmer, chiefly because of the seasonal gain in domestic demands.

Old Material.—Dealers have paid as much as $16.25 for heavy melting steel delivered at Steubenville, Ohio. and more than $16 for delivery at Vandergrift, Pa., which would indicate that even higher prices were paid by consumers at those points, but as evidence is lacking of purchases by users, the sales must be considered in the same class as those of railroad steel at $16.30 and $16.40, or merely dealers' purchases against short sales. The mill market is quotable up to $15.75 on this grade, as one steel company in the Pittsburgh district paid that price for a small tonnage of new bar scrap. Another consumer has bought approximately 10,000 tons of heavy melting steel, paying $15.50, and the fact that a tonnage of this size could be bought at that price indicates that the efforts of dealers to force the market up on the basis of strength in other centers has been successfully resisted. Slightly higher prices than a week ago are obtainable on the acid open-hearth furnace grades, and blast furnace material is definitely higher than a week ago, as high as $12 having been paid for short turnings and borings.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.25 to $15.75
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Bundled sheets, sides and ends	13.50 to 13.75
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	15.25 to 15.75
Heavy breakable cast	14.75 to 15.25
No. 2 railroad wrought	15.25 to 15.75
Heavy steel axle turnings	14.00 to 14.50
Machine shop turnings	12.00 to 12.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.75 to 17.25
Railroad coil and leaf springs	16.75 to 17.25
Rolled steel wheels	16.75 to 17.25
Low phosphorus billet and bloom ends	20.00 to 20.50
Low phosphorus, mill plate	19.50 to 20.00
Low phosphorus, light grade	17.00 to 17.50
Low phosphorus sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	14.00 to 14.50
Electric Furnace Grades:	
Low phosphorus punchings	17.00 to 17.50
Heavy steel axle turnings	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.00 to 12.50
Short mixed borings and turnings	11.00 to 11.50
Cast-iron borings	11.00 to 11.50
No. 2 busheling	10.25 to 10.75
Rolling Mill Grades:	
Steel car axles	19.00 to 20.00
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Rails 3 ft. and under	16.00 to 16.50
Malleable Grades:	
Railroad	15.25 to 15.75
Industrial	14.75 to 15.25
Agricultural	14.25 to 14.75

Smelting and Refining Non-Ferrous Metals in 1925

DATA on the smelting and refining of non-ferrous metals, recently issued by the Bureau of the Census, are shown in the accompanying tabulation:

Since the above tabulation includes smelters which do not refine, and refineries which work on this impure metal, the value of most of the metal in intermediate forms appears twice, and a corresponding duplication enters into the total cost of materials for the industry. The amount of duplication in the statistics for 1925 may be considered as being approximately the value of blister copper ($212,585,900), lead bullion ($80,309,776), and doré ($23,143,757) reported by smelters operated separately from refineries.

The value of products also includes that of many by-products. Chief among these are the following:

By-Products Made in 1925

Copper Smelters and Refineries	
Silver	$62,785,654
Gold	17,165,520
Doré	7,984,603
Platinum and palladium	366,217
Sulphuric acid	444,558
Copper sulphate	1,019,191
Nickel sulphate	142,601
Lead Smelters and Refineries	
Silver	$28,794,158
Gold	24,476,947
Doré	15,159,154
Platinum and palladium	22,785
Paint and paint pigments	7,511,308
Zinc Smelters	
Sulphuric acid	$3,734,126
Paint and paint pigments	14,679,178

Production of Copper, Lead and Zinc in 1925

Metal	No. of Establishments	Wage Earners, Average No.	Wages	Paid for Contract Work	Cost of Materials (a)	Value of Products	Value Added by Manufacture (b)	Horsepower
Copper	26	15,588	$22,641,626	$34,911	$575,190,428	$665,176,767	$91,986,339	326,509
Lead	17	6,115	9,001,580	.....	254,881,029	283,042,542	28,161,513	47,219
Zinc	28	11,289	16,304,701	15,290	83,992,110	118,905,590	34,913,480	86,368
Total	71	32,992	$47,947,907	$50,201	$912,063,567	$1,067,124,899	$155,061,332	460,096
Per cent change since 1914	..	—5.0	65 4	—77.8	59.2	59.5	60.9	76.0

(a) Includes fuel and electric power.
(b) Value of products less cost of materials.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c. to 1.85c.
Sheared	1.80c. to 1.85c.
Universal	1.80c. to 1.85c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $44. Cleveland mill base, $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.50 to $11.00

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.00 to $3.15
Foundry, f.o.b. Connellsville prompt	4.00 to 4.25
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.60 to 1.90
Mine run gas coal, f.o.b. Pa. mines	1.90 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.10 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.25 to 1.40

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$33.00 to $34.00
Domestic, 16 to 19%	32.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$26.50	10%	$32.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c. to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75 to $3.00
F.o.b. Chicago	2.85 to 3.10

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Eastern Mill Books 9000 Tons of Steel for Cars—Pig Iron Active

CHICAGO, Aug. 16.—Heavy tonnage orders for steel are still lacking in this market, and producers, operating only a shade above 65 per cent of ingot capacity, are depending almost wholly on the general run of small business that is emanating from the manufacturing trade and the slack requirements of structural shops. In the meantime steel works production of pig iron is being maintained in unchanged volume. At some plants iron is being accumulated, while at others a portion of the output is being released to the merchant iron market. Rail contracts are about completed, and current specifications on plates, shapes and bars, still at about the weekly average for the year, are not in sufficient volume to sustain mill output at the rate of early August.

New business in plates, shapes and bars has declined. The Bethlehem Steel Co. has booked 9000 tons of plates, shapes and bars to be used in the construction of 200 flat cars and 2500 underframes by the Great Northern Railway. Delivery is to be made by water to Superior, Wis. Ground has been broken in Chicago for a hotel that will require 6000 tons of steel, bringing the total of fresh structural inquiries for the week up to 10,000 tons.

Pig Iron.—Both sales and inquiries are being maintained in recent volume, and shipments have climbed so that the total so far this month is well ahead of the corresponding period in July. Second quarter purchases proved to be heavier than requirements in that period, and much of the iron bought then was carried over into the third quarter. For three weeks now old orders have been running out, and the present buying movement is essentially belated contracting for the third quarter. A Chicago melter is said to have closed for 5000 tons. Fresh inquiry of note includes 2000 tons of foundry iron for a Milwaukee user and 1000 tons of foundry and malleable iron for a melter near Chicago. A steel mill has taken 500 tons of Bessemer ferrosilicon, and a user near Chicago has placed 500 tons of 8 per cent silvery at the full schedule.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$19.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.00
Malleable, not over 2.25 sil.	19.50
High phosphorus	19.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—A steel company has closed for 300 tons of spiegeleisen in the 19 to 21 per cent grade at $33, Hazzard, Pa., or $40.76, delivered at Chicago. Dealers report several small sales at $41.76, delivered Chicago. Specifications for ferrosilicon are larger, but over an extended period they reflect the uncertainty of consumers' operations. Ferromanganese is being sold in carlots at $90, seaboard.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $40.76 to $41.76.

Plates.—A Southwestern oil refiner has ordered new tank construction requiring 1500 tons of plates, and inquiry still pending from the oil industry now stands at 5000 to 6000 tons. As a usual thing tank programs move fast once the steel is purchased, and it is not uncommon for an order to be specified in its entirety at the time that it is placed. Steel required for the Illinois Central cars has practically all been ordered out, and specifications from the railroad car builders this week are the lightest in several months. Miscellaneous orders in small lots from the manufacturing trade are numerous. A local user has placed 500 tons of plates at 2c., Chicago, a price which is fairly well established except to east and south of here, where the freight differential between Chicago and Pittsburgh is 20c. or more. To hold that territory it would be necessary for Chicago mills to go to 1.90c., but inasmuch as business emanating from there has been small, Western producers are limiting their operations to sections where they can maintain a price of 2c. Plate mill operations in this district average about 50 per cent of capacity.

Mill prices on plates per lb.: 2c., base, Chicago.

Structural Material.—Small fabricating awards have bulked fairly large in the last few weeks, and contracts have been well distributed among the smaller shops. Large fabricators are looking forward to a more active demand for large tonnages in the near future and are less inclined to enter the competition on small projects. Ground has been broken for the Bryn Mar Beach Hotel, Chicago, and the contract for the steel required is expected to be closed at an early date. A bridge across the Calumet River, Chicago, will take 1800 tons, and an office building for De Pauw University calls for 1700 tons. A manufacturer near this city has closed for a fair tonnage of plain material at 2c., Chicago, which well represents the price paid by that class of users. At the same time fabricators are having little trouble in obtaining quotations of 1.90c. on lots of 500 tons and over.

Mill prices on plain material per lb.: 1.90c. to 2c., base Chicago.

Reinforcing Bars.—Awards for the week total 2500 tons, mainly rail steel bars. Competition from the South is holding hard steel bars at 1.90c. to 2c., Chicago, and there seems to be little possibility now that this commodity can be advanced in line with the effort being made by dealers to get higher prices for reinforcing bars made from billet steel. It is believed that all low quotations outstanding on billet steel reinforcing bars have been withdrawn and that current bids are on the basis of 2.30c. per lb. on lots of 500 tons and larger, with 2.75c. asked for 25 tons and less. The market has not as yet afforded a test of the new prices.

Rails and Track Supplies.—The heavy-section rail market is dull. The Chesapeake & Ohio is holding open its recent inquiry for 55,000 tons. In the meantime rail mill operations in this district have dropped to 35 to 40 per cent of capacity. Demand for light rails is small by comparison with past years, but business placed so far in August is the largest in several months. Miscellaneous orders for track fastenings include a small tonnage of steel tie plates, several small lots in iron tie plates and 2000 kegs of spikes and bolts. Specifications for accessories are in good volume, and production is steady at 60 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36 to $38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Wire Products.—Specifications and new buying by the manufacturing trade are holding close to the July average. Orders from the jobbing trade are less numerous, indicating that retail stocks are not moving so fast as had been expected by the trade and that for the time being at least jobbers have on hand what they believe to be satisfactory supplies for the late summer business. Notwithstanding that crop conditions have been good in the Northwest, orders from that territory have shown no marked increase. The general situation in the South is said to have improved, but wire manufacturers do not look for a pickup in demand from that district until the early fall months. Mill stocks are well balanced and a trifle heavier than in July. Further additions will not be made until September unless the fall demand should start earlier than usual. Production is variously estimated at 55 to 60 per cent of mill capacity. Mill prices on wire and wire products are shown on page 429.

Bars.—New buying of soft steel bars, while still moderately active, has fallen below the volume of last week. Specifications are steady and for the fourth consecutive week exceed shipments. Bolt and nut manufacturers are less busy, as gaged by specifications, but parts makers for the automobile trade continue to order in heavier tonnages than is customary at this time of

the year. Production of agricultural machinery is running at the average rate of late July. The output of tillage equipment is lagging, but plants making harvesting machinery and tractors are operating close to capacity. Mild steel bars are steady at 2c., Chicago, except in the outlying territory to the east and south. Specifications for alloy steel bars are growing, and production is now between 70 and 75 per cent of capacity. Prices in and near Chicago are holding at about $2 above the level prevailing east of here. Demand for iron bars is spotty and shipments are light. Mill prices in this territory are steady at 2c., Chicago. Rail steel bar mills have fair backlogs, largely because of the demand for hard steel reinforcing bars. Specifications from the manufacturing trade are holding at the level of July, and both Chicago Heights mills continue to operate on a double turn basis. Stocks of fence post material are low for this time of the year, and orders for the finished product for fall delivery, while not yet large, are being received earlier than in past years. Mill prices are steady at 1.90c., Chicago.

Mill prices per lb.: Soft steel bars, 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.90c., base, Chicago.

Bolts, Nuts and Rivets.—Specifications are in smaller volume as the result of lighter requirements by the manufacturers of agricultural machinery and the railroads. The demand for small rivets is fairly steady, but prices continue to lean toward the weak side.

Cast Iron Pipe.—This market is quiet, and prices for tonnage lots are nominal at $38.20 to $41.20, delivered Chicago, for 6-in. and larger diameters. The public ultlities appear to have made known all of their immediate requirements, and the manufacturing trade is dull. Both specifications and new business from contractors are still active, and they afford the only bright spot in this market. Small orders, usually of carlot size, are less numerous, but inquiry for business of that character shows some improvement. With the exception of an inquiry issued by Chicago last week, no public jobs are now before the trade. At Waunakee, Wis., contemplated work has been blocked by an injunction, and a contract that was to have been let by Glencoe, Ill., has been delayed. Chicago is asking for prices on 100 tons of 3-in. to 24-in, fittings, on which bids are to be opened Aug. 26. Pipe foundries are well engaged on old orders, and deliveries range from prompt to about two weeks, depending on the size of pipe wanted.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $38.20 to $41.20; 4-in., $42.20 to $45.20; Class A and gas pipe, $4 extra.

Sheets.—Production by Chicago district mills is steady, and backlogs range from two to three weeks. There is no change in the volume of specifications, and deliveries range from two or three weeks for all classes of sheets. Orders from the South are not gaining, but users in the Northwest are taking out larger quantities. New buying, for the most part in small lots for delivery at the earliest convenience of mills, is expanding and at the moment exceeds by a small margin the current rate of shipments. Mill prices are steady and unchanged.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Hot-Rolled Strip.—Production in this district is at 80 per cent of mill capacity. Most shipments are going to manufacturers of automobiles and automobile parts.

Billets.—New sales are light and specifications have declined. Rerolling billets, 4-in. and over, are being quoted at $33, Chicago.

Coke.—Following the upward trend in pig iron shipments, a larger tonnage of by-product foundry coke is being forwarded from local ovens. Contract prices are steady at $9.75, local ovens, and $10.25, delivered in the Chicago switching district.

Old Material.—The market is easier and, in the absence of consumer buying, prices are nominal. The tension of the situation is somewhat relieved by the fact that shipments by the railroads are lighter and the production of scrap by manufacturers is in smaller volume. Borings are more plentiful, and the threat of a shortage that existed earlier in the month is not now apparent. Receipts of short rails have been heavier, meeting the demand of users and relieving the tightness in that grade. Some distress lots of heavy melting steel have appeared, although not in any great tonnage. This appears to be the result of restricted shipments to steel mills, which have been reducing the amount of scrap used. As a general rule dealers are paying $12.50 per gross ton for heavy melting steel to apply against recent orders taken at $13. There are no indications of an accumulation of stocks either in the hands of melters or in dealers' yards. The belief is general that prices will seek still lower levels at an early date.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	14.00 to 14.50
Hydraulic compressed sheets	11.00 to 11.50
Drop forge flashings	9.25 to 9.75
Forged, cast and rolled steel carwheels	15.50 to 16.00
Railroad tires, charging box size	15.50 to 16.00
Railroad leaf springs, cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.50 to 15.00
Coil springs	15.50 to 16.00
Low phosphorus punchings	14.25 to 14.75
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Axle turnings	11.00 to 11.50
Cast iron borings	10.50 to 11.00
Short shoveling turnings	10.50 to 11.00
Machine shop turnings	7.50 to 8.00
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	15.25 to 15.75
Cupola Grades:	
Steel rails less than 3 ft	16.00 to 16.50
Angle bars, steel	14.50 to 15.00
Cast iron carwheels	14.50 to 15.00
Malleable Grades:	
Railroad	14.50 to 15.00
Agricultural	13.50 to 14.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	21.00 to 21.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	6.00 to 6.50
Locomotive tires, smooth	13.75 to 14.25
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.75 to 15.25
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plate	13.00 to 13.50
Grate bars	11.75 to 12.25
Brake shoes	10.25 to 10.75

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.05c. to 2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Merchant Furnaces Accumulate Backlogs —150,000 Tons of Steel in Bridge

NEW YORK, Aug. 16.—Recent sales of pig iron, although at the sacrifice of prices, have built up backlogs at merchant furnaces. At Buffalo all producers with possibly one exception are reported as being comfortably booked as a result of the buying movement of the past few weeks. According to estimates of the trade, close to 80 per cent of the iron that is to be bought this year has been contracted for. Merchant iron production in this district will be curtailed temporarily at least by the shutting down this week of a furnace at Port Henry, N. Y. Operations are being suspended during the construction of an addition to the company's sintering plant. Pig iron sales in this district during the past week totaled about 13,000 tons, the largest transaction covering 3000 to 4000 tons. The General Electric Co. has entered the market for 350 tons each of No. 2X and No. 1X for August and September delivery at Bayway, N. J., and for 300 tons of No. 2X, 600 tons of No. 1X and 100 tons of 3.25 to 3.75 per cent silicon iron for October to December shipment to its Schenectady, N. Y., plant. The Baird Machine Co., Bridgeport, Conn., has closed against its inquiry for 800 tons of foundry. Although furnaces are said to be taking a stiffer position on prices in quoting on new business, this has not yet been reflected in actual sales. No. 2 plain has been sold at $16, Buffalo, and in some instances No. 2X has been sold at the same figure, indicating a waiving of the silicon differential. Foundry melt in general seems to be holding its own, but in certain industries, notably locomotive and car building, foundry operations are at a low ebb.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$20.91 to $21.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	18.00 to 19.00
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—There is no large demand for either ferromanganese or spiegeleisen. Sales are confined to carload and small lots of both ferroalloys. The aggregate sales of spiegeleisen in the last week have been about 200 to 300 tons. Quotations are unchanged. Specifications on contract are lighter than for some time for all ferroalloys.

Warehouse Business.—Business continues seasonably quiet, with buying confined largely to small lots. There has been some shading of 10c. to 15c. per lb. on desirable tonnages of black and galvanized sheets, but on the general run of business prices are unchanged. On other products price concessions are not reported.

Reinforcing Bars.—The Jones & Laughlin Steel Corporation will furnish 1000 tons of concrete bars for an automobile service building in Manhattan, and the Concrete Steel Co. has taken 600 tons for a sewer in Brooklyn. Other business in the last week has been in comparatively small tonnages. New inquiries are not appearing at the early summer rate, but estimating offices in this territory are being kept busy on old work. Prices are unchanged and as follows:

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.05c. to 3.15c., delivered at job. Out of Youngstown warehouse, 2.40c., Youngstown, or 2.77½c., delivered New York.

Finished Steel.—A moderate improvement in the volume of finished steel business is reported by some sellers, but it has not extended to all products. The most marked betterment is in structural shapes, orders received so far this month by some of the leading interests indicating that August may show the largest bookings of any month this year. Orders for pipe, tin plate and steel bars are slightly larger, but other lines are in about the same position as in July. Sheet consumers are taking a little more interest in the market, but actual orders do not yet show any noteworthy gain, due largely to the fact that shipments received on second quarter contracts at lower than present quoted prices are still providing sufficient raw material for a lessened rate of consumption. Some buyers who have reached the end of their stocks have attempted to obtain concessions in prices, but apparently without success. Fairly large tonnages of black sheets have been offered by consumers at 2.90c., Pittsburgh, while efforts have been made to obtain blue annealed at 2.20c. Mills appear to be holding their ground despite their need for tonnage. Formal request for bids on the steel for the Hudson River bridge, amounting to about 150,000 tons, has been made by the Port Authority of New York. Bids are to be opened Oct. 3. A woman's club building in New York will require 5300 tons of steel. July lettings of structural steel in the metropolitan district, exclusive of bridges, subways, etc., as reported by the

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard,	5.75c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
⅝ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
⅝-in. butt	51	37
½-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	4	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Structural Steel Board of Trade of New York, were 74,000 tons. This is the highest total for any month since October, 1925, and compares with 32,000 tons in June this year, and with 41,000 tons in July, 1926.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c.; plates, 2.09c. to 2.14c.; structural shapes, 1.90c. to 2.04c.; bar iron, 2.14c.

Cast Iron Pipe.—Although little tonnage is before the trade, prices are a shade weaker than a week ago, now ranging from $30 to $31 per net ton, Birmingham, for 6-in. and larger diameters. The construction of plants to make centrifugal pipe, both by the DeLavaud and monocast methods, has resulted in a material expansion of capacity, which is now reflected in sharper competition. Baltimore postponed until this week the taking of bids on 1200 tons, mostly 24-in. and smaller. Springfield, Mass., has taken contractors' bids on 3000 tons. The New York Department of Water Supply, Gas and Electricity contemplates buying 5000 tons, but has not yet asked for bids.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $39.25 to $40.25; 4-in. and 5-in., $44.25 to $45.25; 3-in., $54.25 to $55.25; Class A and gas pipe, $4 to $5 extra.

Coke.—Foundry coke specifications are improving somewhat. The large stocks that melters accumulated prior to the coal strike have been reduced to a point where replenishment is regarded as advisable. With a by-product coke plant in this district current specifications are in excess of production. Prices on Connellsville coke are substantially unchanged, although reported as slightly firmer. Delivered prices on Connellsville foundry coke are: To northern New Jersey, $8.03 to $8.28; to New York or Brooklyn, $8.79 to $9.04; to Newark or Jersey City, N. J., $7.91 to $8.16. Prices on by-product foundry coke are unchanged at $9.59 to $10.77 per net ton, delivered Newark or Jersey City.

Old Material.—The stronger tone that characterized the market earlier in the month has weakened somewhat in the last few days. Several thousand tons of heavy melting steel has been bought by the Claymont, Del., consumer at $14, delivered, or at the same price it paid in its last previous purchase. Heavy melting yard steel is slightly stronger, recent sales having been made at an advance of 25c. over the previous quotation, or $7.25, f.o.b. New York. There has also been an advance of 50c. a ton in stove plate, and eastern Pennsylvania consumers are now paying $8.50 to $9 at New York. There have been no important changes in the quotations for other grades since the first of the month.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.75 to 7.25
No. 1 heavy breakable cast	10.75 to 12.50
Stove plate (steel works)	8.50 to 9.00
Locomotive grate bars	8.00 to 8.50
Machine shop turnings	6.50 to 7.00
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	7.00 to 7.50
Mixed borings and turnings	7.00 to 7.50
Steel car axles	15.75 to 16.25
Iron car axles (nom.)	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	7.75 to 8.25
Forge fire	6.50 to 7.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought, long	10.50 to 11.00
Rails for rolling	10.25 to 10.75
Cast iron carwheels	10.75 to 11.25
Stove plate (foundry)	9.00 to 9.75
Malleable cast (railroad)	10.75 to 11.25
Cast borings (chemical)	11.75 to 12.75

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00 to $14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to 12.00

The Weirton Steel Co., Weirton, W. Va., has its new No. 11 open-hearth furnace almost completed. This unit has a rated capacity of 200 tons per heat and with its completion the company will have five furnaces of that capacity and six rated at 100 tons per heat.

Philadelphia

Pig Iron and Finished Steel Sales Show a Moderate Gain

PHILADELPHIA, Aug. 16.—Sales of pig iron and finished steel showed a moderate improvement in the last week, giving rise to the hope that the looked-for upward trend in business may actually have started. Low prices for pig iron have interested buyers to the extent that a number have closed on their requirements to the end of the year. Sales in the past week have totaled 15,000 to 20,000 tons of foundry iron and a few thousand tons of basic iron. The improvement in finished steel business has covered nearly all lines, but is most marked in structural shapes, plates, bars and sheets. July was an unusually dull month in the latter three lines.

Pig Iron.—Foundry iron business was larger in the past week than in any week so far in this quarter. Sales amounted to 15,000 to 20,000 tons, including one lot of 10,000 tons, two of 2000 tons each, one or two of 1000 tons and a number of 100 and 200-ton lots. In addition, a steel company took a few thousand tons of basic iron at a reported delivered price of $20. The low prices at which iron is being sold have impressed buyers with the desirability of covering their requirements to the end of the year, and most of the current orders are scheduled for delivery in the last four months. Usual quotations on the more desirable orders are $20, furnace, for No. 2 plain and $20.50 for No. 2X, but when a seller is obliged to absorb some of the freight the actual net price at furnace is occasionally lower. No. 2X iron has been sold at $20.25, furnace. Buffalo iron continues to be a factor in this district, notwithstanding reports that some Buffalo sellers have raised their quotations. Buffalo iron was sold at an eastern Pennsylvania point at $20.91, the freight rate being $4.41.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76 to $21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 21.76
East. Pa. No. 1X	21.76 to 22.26
Basic (delivered eastern Pa.)	20.00
Gray forge	20.50 to 21.00
Malleable	21.50 to 22.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	24.50 to 25.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17
Virginia No. 2X, 2.25 to 2.75 sil.	26.67

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $5.17 from Virginia furnaces.

Plates.—A slight improvement in the volume of plate orders is noticed by some mills. One important Eastern producer is now operating at about 65 per cent, which is about 15 per cent above its July average. Orders continue small but are more numerous. The price situation shows little, if any, change. Small lots are being sold at 1.80c., Pittsburgh, with the larger

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.80c. to 3.00c.
Plates, $\frac{3}{16}$-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.25c.
Steel bands, No. 12 gage to $\frac{3}{16}$-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.35c.
Galvanized sheets (No. 24)	5.20c.
Blue annealed sheets (No. 10)	3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
$\frac{3}{16}$-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

lots commanding a concession of $1 a ton, while preferred customers are in some instances getting 1.70c.

Structural Shapes.—The volume of business in structural shapes, although mostly in small lots, shows a slightly upward trend so far this month as compared with July. Some mills are showing resistance to further price concessions. About 6000 tons of fabricated material for a section of the Broad Street subway will be furnished by the American Bridge Co. A Philadelphia highway bridge, now up for bids, will take 3000 tons, a Y. M. C. A. building about 1500 tons, and a school in Camden 700 tons. The Pennsylvania Railroad has begun work on the subway which is to connect its new West Philadelphia terminal with Broad Street, and inquiries for the steel requirements, which are expected to be large, may soon come into the market.

Bars.—Demand for steel bars is larger than the average for last month. The price situation remains firm, with quotations uniform at 1.80c., Pittsburgh, for the ordinary lots. Bar iron is quoted at 2.12c., Philadelphia.

Sheets.—Some consumers of sheets who have been getting shipments on second quarter contracts at slightly lower than today's prices have made efforts to break the new quotations, but apparently without success. Orders are a little more numerous this month than last, and so far as can be ascertained the full prices are being quoted in all cases. These are: 2.25c. for blue annealed, 3c. for black and 3.85c. for galvanized, Pittsburgh base.

Imports.—Only 500 tons of foreign pig iron came in at Philadelphia last week, all from France. Steel imports consisted of 191 tons of structural shapes from France and 151 tons from Belgium; 45 tons of hoops and bands from Belgium and 14 tons from France. Forty-two hundred tons of chrome ore was received from Portuguese Africa.

Old Material.—A steel company has bought 6000 to 8000 tons of heavy melting steel at $14, delivered, and is in the market for additional tonnage at the same figure. In view of the strength which the market has gained in the last few weeks, this appears to be the minimum at which sales would be made, and at the same time it is the maximum that has been reached. Other grades are a little firmer, heavy breakable cast now being quotable at $15.50 to $16, delivered, on the basis of sales; cast iron car wheels are $15.50; couplers and knuckles have been sold at $16.75, and rolled steel wheels, at $16. Dealers are doing more to support the market than consumers, as the former are doing some speculative buying while the latter are content merely to fill their actual requirements in a conservative way.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel		$14.00
Scrap T rails	$13.00 to	13.50
No. 2 heavy melting steel	11.50 to	12.00
No. 1 railroad wrought	15.50 to	16.00
Bundled sheets (for steel works)		11.00
Machine shop turnings (for steel works)		11.00
Heavy axle turnings (or equivalent)	12.50 to	13.00
Cast borings (for steel works and rolling mill)	11.00 to	11.50
Heavy breakable cast (for steel works)	15.50 to	16.00
Railroad grate bars		13.00
Stove plate (for steel works)		13.00
No. 1 low phos., heavy, 0.04 per cent and under	18.50 to	19.50
Couplers and knuckles		16.75
Rolled steel wheels		16.00
No. 1 blast furnace scrap		10.50
Machine shop turnings (for rolling mill)	11.00 to	11.50
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to	12.50
Shafting	17.50 to	18.00
Steel axles	19.00 to	20.00
No. 1 forge fire		11.00
Steel rails for rolling	16.00 to	16.50
Cast iron carwheels		15.50
No. 1 cast	16.00 to	16.50
Cast borings (for chemical plant)	15.00 to	15.50

Mining and industrial locomotives shipped in the second quarter of 1927 are reported by the Department of Commerce at 233 units, aggregating $1,053,812. This is the lowest dollar value since a year ago, when the total was $948,851 in 207 units. In the first quarter of 1927 there were 283 units, valued at $1,372,225.

Cleveland

Pig Iron Sales Total 50,000 Tons—Steel Trade Sluggish

CLEVELAND, Aug. 16.—Resumption of pig iron buying throughout northern Ohio and adjacent territory upon something like the July scale has resulted in about 50,000 tons being placed. Meanwhile pig iron quotations have not stiffened appreciably, although efforts are being made by sellers to get $17.50, Cleveland, for outside delivery. The Lake Superior iron ore trade is moving along steadily, although purchases are infrequent and mostly for fill-in purposes at steel works furnaces. The semi-finished steel market shows no more new features than does the finished trade, and so far the automobile interests in this and adjoining States have not come through with their expected larger buying of sheets and strips. Tin mill activities are mainly dependent upon driblets of orders.

Pig Iron.—An aggregate of 50,000 tons of foundry and malleable has been sold in the past week. Deliveries upon much of this tonnage extend to end of year. The aggregate is composed of many small orders, ranging from 400 to 1000 tons each. In strictly Cleveland territory furnaces are selling at $18.50, furnace, and for outside shipment to meet competition $17.50, furnace, is being sought but not always obtained.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.00
Southern fdy., sil. 1.75 to 2.25	23.25
Malleable	19.00
Ohio silvery, 8 per cent	31.50
Basic, Valley furnace	17.25
Standard low phos., Valley fur.	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—Consumers of billets, slabs and sheet bars in this locality appear interested only in supplies for their immediate needs. Former long time or period contracts for these materials are no longer in evidence. Sheet bars are quoted at $34, Cleveland and Youngstown, while billets and slabs are bringing $33.

Steel Sheets.—Still lacking the expected broader demand for common and full-finished material from the automotive industry, northern Ohio mills are yet able to make a creditable showing of activity. Northern Ohio mills are able to operate around 50 per cent, and Mahoning Valley mills, around 55 per cent. About 86 out of 127 independent hot mills in the Youngstown district are operating this week, compared with 94 last week and 72 in the preceding week. Two entire plants at Niles are idle this week, but hope to resume next week. Ten units of the No. 2 plant at Farrell, Pa., of the American Sheet & Tin Plate Co., are idle this week for repairs, leaving Nos. 1 and 3 plants active, No. 1 having been repaired last week. Sheet makers in this territory unite in declaring their market is by all odds the most stable of all departments of the steel trade, this being a most unusual situation in the sheet industry over a long series of years. In line with this declaration is the continued firmness of sheet prices.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 3.00c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.65c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Tin Plate.—Largely through the accumulation of a number of small orders, mills in eastern Ohio are able to operate this week at almost capacity rates. Important canners have been furnishing some fill-in specifications, but large single orders are lacking.

Strip Steel.—There has been a sufficient volume of fresh specifications to keep mills in northern Ohio reasonably active and to encourage them to hope for better things later in the year. Practically all strip mills are operating around 70 to 80 per cent, and the inflow of small orders is in sustained volume. Large individual orders from automobile accessories makers, however, are lacking. Hot-rolled strip is in fair demand, with the call for cold-rolled even better. Hot-rolled is quoted at 2.10c., Pittsburgh, and cold, for all widths under 12 in., 3.25c., Pittsburgh and Cleveland. Strip sheets, 12 in. and wider, are bringing 3c., Pittsburgh and Cleveland.

Steel Bars.—The changing nature of the steel bar trade in the Central West is now being recognized by the mills. Whereas formerly thousands of tons went to the agricultural trade and other thousands went into the building of steel freight cars, now there are large bar mills that do not deliver a pound to an implement maker or car builder. Bar mill operations are very irregular in northern Ohio. One large company has three important bar mills idle; another, six idle. Orders are coming in by driblets, and the price, whether 1.80c. or 1.85c., Pittsburgh, does not appear to interest buyers at this time.

Bolts, Nuts and Rivets.—On bolts and nuts 70 off for large lots and 60 off for small lots are the going discounts. A fair volume of business is coming to bolt makers, enough to keep them on a 50 per cent basis of operations, but with no sizable business in sight. Automobile builders are buying nuts, bolts and rivets only in sufficient quantities to cover immediate needs.

Old Material.—The recent tendency toward strength in northern Ohio markets, which was mainly a reflection of conditions at Pittsburgh and Chicago, has passed, and prices are softening. In the absence of important purchases by consumers, however, ruling market quotations are not clearly defined. The shipment of most of the available compressed sheet scrap from Detroit to Buffalo by water has made dealers here cautious in selling that grade. Although prices on compressed sheets at Cleveland and Pittsburgh are 25c. to 50c. a ton higher than at the beginning of the month, little tonnage has been diverted from the Detroit-Buffalo movement. Borings and turnings are still a drug on the market.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.00 to $14.25
No. 2 heavy melting steel	13.50 to 13.75
Compressed sheet steel	13.25 to 13.50
Light bundled sheet stampings	11.50 to 12.00
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.25 to 9.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.00
No. 1 busheling	11.50 to 11.75
Pipes and flues	10.00 to 10.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.00 to 16.50
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling	16.25 to 16.50

CHANGES IN USE OF FUELS

Early Efforts to Substitute Coke for Charcoal in Blast Furnaces

SOME of the early history of the use of fuel was traced recently by Dr. Arthur D. Little, Boston, at a meeting of the Engineering Foundation board in New York. The following paragraphs taken from his paper show, among other things, the earliest efforts on record to substitute the use of coke for that of charcoal in smelting iron ore.

"In 1804 the British Admiralty declared it their duty 'to discourage the employment of steam vessels as . . . the introduction of steam vessels was calculated to strike a fatal blow to the naval supremacy of England.'

"In 1619 the growing scarcity of wood in England led Dudley to attempt the substitution of coal for charcoal in his blast furnace. The charcoal iron-masters drove him out of Worcester County. He set up another furnace at Hascobridge. A riot was organized and the furnace wrecked. In 1660 Dudley was still at work, undaunted, but unsuccessful.

"Fortune dealt more generously with Abraham Darby, although with much deliberation. His use of coke in place of charcoal began about 1730, and in December, 1756, his furnace was declared to be 'at the top pinnacle of prosperity, 20 to 22 tons a week and sold off as soon as made at profit enough.'

"At a time not later than 1688, and possibly somewhat earlier, the Rev. John Clayton heated coal in a retort and obtained gas and tar. He demonstrated that the gas could be burned and that it could be collected and stored. His results were duly published in a memoir, and forgotten."

Canadian Ore Production Negligible and That of Newfoundland Declines

TORONTO, ONT., Aug. 12.—Iron ore production in Canada in 1926 was practically negligible, according to the Dominion Bureau of Statistics. Illmenite, amounting to 200 tons and valued at $600, was shipped by the Manitou Iron Mining Co. to England for experimental purposes. Research work is being carried on by the Department of Mines at Ottawa on the illmenite ores of Quebec, with a view to making an economic recovery of both titanium and the iron. Titanium oxide is being recognized as a valuable material for use in the manufacture of paints. It is held better than white lead for some purposes, because of its ability to withstand corrosive action.

The British Empire Steel Corporation of Nova Scotia continued to operate the Wabana mines of Newfoundland, and during the year shipped 969,601 net tons of ore. Of this amount 503,640 tons was exported to Europe and the remaining 465,961 tons was shipped to Canada. In 1925, shipments of Wabana iron ore amounted to 1,267,851 tons, of which 883,056 tons was exported to Europe and the remainder sent into Canada.

More bituminous coal has been carried by water to upper Lake ports in 1927 than ever before, according to the American Railway Association. From Jan. 1 to July 24, vessels at Lake Erie ports received 18,026,573 tons for shipment up the Lakes. This exceeded by 3,393,489 tons the best previous record for the period, established in 1923. It was better by 4,343,034 tons than the amount last year.

A vacation conference for the training of business executives has been arranged by the Associated Industries of Massachusetts in cooperation with the Boston University College of Business Administration, to be held at the university Aug. 29 to Sept. 2. Two divisions have been arranged, one dealing with production and the other with distribution, and a series of plant visitations will be included in the program.

San Francisco

Eastern Mills Generally Advance Plates $2 and Shapes $1 a Ton

SAN FRANCISCO, Aug. 13 (*By Air Mail*).—Shapes and plates have been advanced $1 and $2 a ton respectively by most of the Eastern mills. This action has been taken by the mills because of the increase of $3 a ton in freight rates on steel shipped from Atlantic ports via the Panama Canal to the Pacific Coast, which became effective Aug. 1. It is understood, however, that the mills are giving buyers protection on all inquiries made before the price advance was put into effect.

Of interest in a week of light buying in nearly all departments of the market was the arrival at this port of 920 tons of pig iron from India, 4000 tons of coke from England and Germany, and 400 tons of bars and shapes and 100 kegs of wire nails from Antwerp.

Pig Iron.—Buying is light, and fresh inquiry is for immediate requirements only. A local importer brought in 920 tons of Indian iron during the week. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated structural steel for the week total 3230 tons. Fresh inquiry is unimportant. The largest individual letting, 2500 tons for a hotel building in San Francisco, was taken by the Pacific Rolling Mill Co. of this city. Eastern mills have advanced their quotations on plain material $1 a ton and are now asking 2.40c., c.i.f. Coast ports.

Plates.—Quotations have been advanced $2 a ton by most of the Eastern mills. While 2.40c. c.i.f. Coast ports, is now the asking price on plates, protection is being given buyers who had inquiries pending at the time that the new price was put into effect. Fresh inquiry is confined to lots of less than 100 tons. In Tacoma, Wash., the Birchfield Boiler Works is low bidder on a pipe line for the municipality which may require about 900 tons.

Bars.—Reinforcing bar awards for the week total nearly 1800 tons. Fresh inquiries, however, continue to lag. The largest individual letting, 500 tons for drainage work in Los Angeles, was taken by an unnamed company. Local reinforcing bar jobbers quote as follows: 2.75c. to 2.85c., base, per lb. on lots of 200 tons, and 3c. to 3.10c., base, on less-than-carload lots. Eastern mills continue to quote about 2.35c., c.i.f. Coast ports, on both reinforcing and merchant bars, and local mills quote about 2c.

Cast Iron Pipe.—Public lettings have been neither numerous nor heavy. San Diego, Cal., has placed 243 tons of 4 to 16-in. Class C pipe with the R. E. Hazard Construction Co. Tacoma, Wash., has awarded 514 tons to two local contractors. Bids are being taken in Tucson, Ariz., on 206 tons of 3 to 8-in. Class C pipe, and Burlingame, Cal., will open bids Aug. 15 on 781 tons of 8 to 16-in. pipe. Cast iron pipe, 6-in. and larger, is quotable at $43 per ton, f.o.b. dock, San Francisco.

Steel Pipe.—The Grinnell Co. of the Pacific, San Francisco, has been awarded 249 tons of 1 to 4-in. standard pipe by the city of San Francisco for the Hetch-Hetchy project. The Santa Maria Gas Co., Santa Maria, Cal., is inquiring for 75 to 110 tons of 6 to 8-in. line pipe. The city of Los Angeles is inquiring for 145 tons of ½ to 2-in. black and galvanized pipe required under Specification Adv. No. W-817. The Pacific Gas & Electric Co., San Francisco, is in the market for 278 tons of 2-in. line pipe.

Warehouse Business.—Sales are light, and fresh inquiries are confined to small lots. Quotations are unchanged.

Ferroalloys.—A local importer during the week brought in about 50 tons of English spiegeleisen. Quotations are made on specific inquiries only. Sales in this department of the market are light.

Coke.—A local importer brought in 4000 tons of English and German by-product and beehive coke during the week. Part of this shipment will be unloaded at Los Angeles. Inquiries are small. Quotations on foundry coke are unchanged as follows:

English beehive coke, $16 to $17 per net ton at incoming dock; English by-product, $12 to $13, and German by-product, $11.50 to $12.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.10c.
Small angles, ⅞-in. and over	3.10c.
Small angles, under ⅞-in.	3.60c.
Small channels and tees, ¾-in. to 2¾-in.	3.70c.
Spring steel, ½-in. and thicker	5.10c.
Black sheets (No. 24)	3.85c.
Blue annealed sheets (No. 10)	4.90c.
Galvanized sheets (No. 24)	5.45c.
Structural rivets, ½-in. and larger	5.50c.
Common wire nails, base per keg	$3.45
Cement coated nails, 100-lb. keg	3.45

St. Louis

Pig Iron Selling Tapers—Scrap Situation Gains Strength

ST. LOUIS, Aug. 16.—Buying of pig iron has eased off as compared with earlier in the month. Melters have provided for their immediate requirements, and are disposed to postpone further purchases until new orders for finished products have been booked. Actual transactions in the week aggregated approximately 3000 tons. Two Iowa specialty manufacturers bought 500 tons each, and 300 tons was taken by a local machine builder. Most of the iron sold was for delivery through the remainder of the year, and the entire tonnage consisted of foundry grades, no basic having been sold. Prices remain steady.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	21.66
Southern No. 2 fdy., delivered	21.67
Northern malleable, delivered	21.66
Northern basic, delivered	21.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Developments in the coke situation were negative. Users of foundry grades are taking in their contract quotas as due, but new purchasing is confined to small amounts for fill-in purposes. Virtually all current business is being handled by the by-product interests, which continue to operate at from 90 to 100 per cent of capacity. Prices are unchanged, with the leading local producer asking $9.75, ovens, for foundry coke.

Finished Iron and Steel.—Producers and distributers of iron and steel report a quiet business, but with the total volume about up to the seasonal average of the past few years. Fabricators are receiving some small orders, which with their backlogs permit them to continue operations at about the rate prevailing at the close of July. Specifications on plates are holding up fairly well, but tank plates are slow, owing to depres-

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagons, blank or tapped	60

sion in the railroad car building industry and curtailed operations in the oil fields. Reinforcing bar producers report the quietest week this summer. Implement and stove makers have increased their orders and are hopeful of fall and winter betterment.

Old Material.—Further strength has developed in the scrap market, with steel specialties and rails showing the greatest firmness. An important East Side mill has purchased a round tonnage of these grades at prices higher than any offered in recent months. Stocks in dealers' yards are not large and, in most instances, are far from complete. Considerable difficulty is being experienced by the middlemen in securing certain items for shipment against contracts. Railroads are availing themselves of the eagerness of dealers to buy and are marketing liberal tonnages. Lists included the following: Terminal Railroad Association of St. Louis, 2000 tons; Texas & Pacific, 3200 tons; Rock Island, 8000 tons; Nickel Plate, 500 tons; Gulf Coast Lines, 800 tons; Wabash, 3600 tons; Chesapeake & Ohio, 13,500 tons; Southern Railway, 5800 tons, and Monon, 1000 tons.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$11.50 to $12.00
No. 1 locomotive tires	14.25 to 14.75
Heavy shoveling steel	11.50 to 12.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	14.50 to 15.00
Railroad springs	15.00 to 15.50
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	10.25 to 10.75
Cast iron borings	9.25 to 9.75
Iron rails	12.50 to 13.00
Rails for rolling	14.50 to 15.00
Machine shop turnings	6.75 to 7.25
Steel car axles	19.00 to 19.50
Iron car axles	22.50 to 23.00
Wrought iron bars and transoms	18.75 to 19.25
No. 1 railroad wrought	11.00 to 11.50
Steel rails, less than 3 ft	15.50 to 16.00
Steel angle bars	12.50 to 13.00
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	13.25 to 13.75
No. 1 railroad cast	15.00 to 15.50
Agricultural malleable	12.50 to 13.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Toronto

Price Cut Fails to Stimulate Pig Iron Buying—Scrap Dull

TORONTO, ONT., Aug. 16.—The recent decline of 50c. a ton in pig iron prices has had no apparent effect on the market in general. Sales in the past week did not exceed the average for the previous few weeks. There has been no resumption of forward buying by melters, although a few appear to be interested and inquiries are appearing. At the moment local blast furnace representatives do not appear anxious to close long term contracts, and one or two have withdrawn from the market, accepting only such orders as are placed by old customers for immediate needs. Spot orders calling for 50 to 200 tons are appearing regularly. Releases against contracts are also being received on schedule. The daily melt remains high and the production of pig iron is on the upgrade, especially of basic iron for the further use of producing firms.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	26.00
No. 2 foundry, sil. 1.75 to 2.25	26.00
Malleable	26.00
Basic	25.00
Imported Iron at Montreal Warehouse	
Summerlee	36.00
Carron	36.00

Old Material.—The reduction in pig iron prices has affected neither demand nor prices in this market. Dealers report dullness both in the Toronto and Montreal districts, with current business confined to small tonnages for immediate needs of consumers. No future contracting has featured the market for some time past, although those who have covered are continually placing shipping orders. Foundries and other consumers throughout Ontario and Quebec are carrying sufficient stocks for a week or two longer, after which it is expected that there will be another active buying movement until depleted stocks have been replaced. The stagnation that has featured some of the United States markets has been reflected in Canada's export scrap trade. While some inquiries are being received and small shipments are made from time to time to buyers across the border, business is much below expectations. Prices are firm but unchanged.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$10.50	$9.00
Rails, scrap	11.00	10.00
No. 1 wrought	11.00	14.00
Machine shop turnings	8.00	7.50
Boiler plate	8.00	8.00
Heavy axle turnings	8.50	8.50
Cast borings	8.50	7.50
Steel turnings	8.00	8.00
Wrought pipe	6.00	6.00
Steel axles	15.00	17.00
Axles, wrought iron	17.00	19.00
Per Net Ton		
No. 1 machinery cast	16.00	18.00
Stove plate	10.00	13.00
Standard carwheels	14.00	16.00
Malleable scrap	14.00	14.00

Birmingham

Slightly Better Business in Pig Iron and Pipe—Ensley Works Resumes

BIRMINGHAM, Aug. 16.—Small-lot orders for pig iron are more numerous, and prices are holding at $17.25 per ton, Birmingham, for No. 2 foundry. Surplus stocks of pig iron on furnace banks are no longer showing any material increase. Of 20 furnaces in blast in Alabama, 12 are making foundry iron, seven are on basic and one is on ferromanganese. With two producers shipments are now virtually equal to output. Smaller melters are buying pig iron from fortnight to fortnight, while larger users are doing little better. No fourth quarter business has been placed.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$17.25
No. 1 foundry, 2.25 to 2.75 sil.	17.75
Basic	17.25
Charcoal, warm blast	29.00

Rolled Steel.—There is better feeling in the steel market here, mainly because of the improved outlook in agricultural sections. Shipments of the lighter forms of finished steel, such as cotton ties, wire and nails, are in good volume. The resumption of operations this week at the Ensley works of the Tennessee Coal, Iron & Railroad Co. is also an encouraging influence. Fabricating shops, on the other hand, report a decline in business. Mill prices on finished steel are unchanged.

Cast Iron Pipe.—Recent price reductions on pressure pipe have brought in some business, and increased shipments are cutting down stocks in pipe shop yards. Competition is still very keen, and as low as $30 per net ton, Birmingham, has been quoted on 6-in. and larger diameters, although $31 is more commonly named.

Coke.—A steady flow of inquiries and slightly heavier sales point to heavier production in the near future. Independent coke makers have virtually no stocks, and a pig iron producer equipped with coking capacity recently entered the open market and sold a considerable tonnage of coke. By-product foundry coke prices are unchanged at $5.50 per net ton, Birmingham, while $6 is quoted on beehive coke.

Old Material.—Heavy melting steel is being shipped in good volume, following purchases by the larger consumers, one of whom recently bought 6500 tons. Quotations on this grade are unchanged at $10.50 to $11. Prices on other grades are also unchanged.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.50 to $11.00
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
Rails for rolling	13.00 to 14.00
No. 1 cast	14.00 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.00 to 13.50

Buffalo

Pig Iron Weaker—New Scrap Specifications Effective Sept. 1

BUFFALO, Aug. 16.—A total of between 12,000 and 15,000 tons of pig iron is estimated to have been booked by Buffalo furnaces during the past week. Two 1000-ton inquiries for foundry came out during the week, both of which were taken by one furnace which sold a total of 5000 tons. Numerous smaller orders, calling for 100 to 300 tons each, were booked. Very little of the week's business was placed as a result of broadcast inquiries; most of it was brought out by solicitation. Prices are weaker, with a $1 spread on No. 2 plain foundry. Some of the furnaces are taking No. 2 plain on a $16 base, though so far as can be learned most of the malleable sold is bringing $16.75, base. Some of the makers continue to get $17 on smaller lots, and one furnace at least will not take any business at less than $17.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$16.00 to $16.75
No. 2X foundry, sil. 2.25 to 2.75	16.50 to 17.25
No. 1X foundry, sil. 2.75 to 3.25	17.50 to 18.25
Malleable, sil. up to 2.25	16.25 to 16.75
Basic	16.25 to 16.75
Lake Superior charcoal	27.28

Old Material.—One of the mills continues to suspend shipments against contracts. New specifications on heavy melting for the Lackawanna plant of the Bethlehem Steel Corporation are to become effective Sept. 1. No. 2 steel has strengthened slightly, as the previous prices of $14 to $14.25 made it unprofitable for the smaller dealers to pick up the country scrap. An upward swing in machine shop turnings is expected with the strengthening of outside markets. Stove plate is scarce, but there is no buying of this grade by the consumer. The market for No. 1 machinery cast has strengthened. Following a large transaction a couple of weeks ago, another lot of 2000 tons of this material was sold at $15.25 and considerable difficulty is being experienced filling the order at that figure.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.75 to $15.00
No. 2 heavy melting steel	14.00 to 14.25
Scrap rails	14.50 to 15.00
Hydraulic compressed sheets	12.75 to 13.25
Hand-bundled sheets	9.00 to 9.50
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.00 to 13.25
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.50 to 10.00
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.75 to 16.25
Railroad coil and leaf springs	15.00 to 15.75
Rolled steel wheels	15.75 to 16.25
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	10.75 to 11.00
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades	
Steel car axles	15.00 to 16.00
No. 1 railroad wrought	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast	15.25 to 15.75
Stove plate	13.00 to 13.50
Locomotive grate bars	11.00 to 11.50
Steel rails, 3 ft. and under	16.50 to 17.00
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	15.00 to 15.50
Agricultural	15.00 to 15.50
Industrial	15.00 to 15.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Finished Iron and Steel.—Business in bars shows improvement, with mill prices firm at 2.065c., Buffalo, and tending to strengthen. No large inquiries have come out, but there was been a wide assortment of small ones. The shape market is somewhat more active, with mill prices pegged at 2.065c., Buffalo. Sheet prices are steady. The market for alloy steel shows more life, and a local maker is developing a good volume of production. In the reinforcing bar market, which continues to show activity, one 1000-ton lot has been booked by a Buffalo maker. Operations are virtually unchanged, and the Donner Steel Co. expects to increase open-hearth operations shortly. A leading bolt producer has issued a new packing list covering carriage bolts, machine bolts and lag bolts which shows smaller full container quantities on slower-moving sizes of bolts and shows a reduction in extras for less than full container quantities of nuts.

Cincinnati

Price Shading on Southern Pig Iron—Melting Steel Scrap Advances

CINCINNATI, Aug. 16.—Pig iron buying in the past week has been in small volume, and inquiries are scarce. While a few consumers are purchasing fourth quarter iron, the majority are covering only current requirements. The prevailing opinion is that prices are not likely to advance in the next month and there are possibilities of producers making further concessions. Southern Ohio foundry iron is being held at $18.50 to $19, base Ironton, but little business has been booked at those figures. Lake Erie furnaces are still selling at $17 to $17.50, base furnace, and are strong bidders for the tonnages being placed by melters in southern Ohio and in Indiana. Shading of $17.25, base Birmingham, is reported on orders for Southern iron at Louisville. There has been no change in Jackson County silvery, which remains at $28.50, base furnace, for 8 per cent. An agricultural implement maker at Springfield, Ohio, is inquiring for 500 tons of foundry iron, while another consumer at that point is asking for a like tonnage. A Michigan melter is expected to buy about 1500 tons of malleable.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.39 to $20.89
So. Ohio malleable	20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	20.94
Alabama fdy., sil. 2.25 to 2.75	21.44
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Bookings in the past week have been moderate in volume, but without exception have been confined to current needs of consumers. While the market cannot be described as showing strength, producers are pleased with the present situation, which promises well for the development of good business in the early fall. Agricultural conditions in this territory are regarded as normal, even though crops are somewhat late, and farmers are expected to have considerable buying power in September and October. While sheet

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

mills are having difficulty in keeping orders ahead of production, the number of orders received from day to day has been sufficient to insure continuation of operations at approximately 85 per cent. Much of the current business is from the jobbing trade. Automobile manufacturers are marking time until the Ford Motor Co. places its new car on the market, and are taking only small quantities of material. Prices are being well maintained at 3c., base Pittsburgh, for black, 3.85c. for galvanized and 2.25c. for blue annealed. Activity in structural steel is at a high point for midsummer. Small fabricators are in need of work, but larger shops are receiving a good run of orders. The largest pending job is 4000 tons for a bridge across the Ohio River at Paducah, Ky. Builders of gas-holders report that operations are holding up well. The Stacey Mfg. Co. will erect several holders for which 1200 tons of steel will be necessary. The wire goods market is sluggish at the moment, sales having been light and inquiries scarce. Common wire nails are quoted at $2.69 a keg, delivered at Cincinnati.

Reinforcing Bars.—The West Virginia Rail Co. is reported to have taken approximately 100 tons of bars for the piers of the new Chesapeake & Ohio bridge over the Ohio River at Cincinnati, but the remainder of the tonnage, amounting to 400 tons, has not been placed by the U. G. I. Construction Co., general contractor. Prices are unchanged, new billet stock bringing 1.80c., base Pittsburgh, and rail steel bars 1.70c., base mill.

Warehouse Business.—In the first half of August sales were about 15 per cent better than in the corresponding period of July. The demand for shapes, plates and bars has been outstanding. Prices on all commodities are firm.

Coke.—A slight betterment in by-product foundry coke specifications is reported. Shipments in August probably will run from 5 to 10 per cent above those of July if the present rate continues until the end of the month. Greater activity in by-product domestic coke is a source of encouragement to dealers and producers. Domestic sizes probably will advance 50c. a ton Sept. 1, although no announcement to that effect has been made.

Foundry coke prices per net ton, delivered Cincinnati: By-products coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Heavy melting steel is up 50c. a ton, and dealers are now paying from $12.50 to $13. This increase is based on an anticipated strengthening of prices when mills contract for material rather than on the present condition of the market. In fact, steel plants are refusing to buy for future needs, and in certain instances temporary suspension of current shipments has been requested. Railroad offerings last week brought prices considerably higher than those paid in July. In addition to melting steel a number of other grades have advanced from 25c. to 50c. a ton. For foundry grades there is practically no market, because foundry operations in this district are at such a low point.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	13.25 to 13.75
Loose sheet clippings	9.00 to 9.50
Champion bundled sheets	9.50 to 10.00
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	14.00 to 14.50
No. 1 locomotive tires	14.25 to 14.75
No. 1 railroad wrought	12.00 to 12.50
Short rails	17.75 to 18.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.50 to 11.00
Brake shoes	10.25 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.50 to 13.00

Patterns and tools used in the manufacture of the I. H. Johnson, Jr., Co.'s (Philadelphia) engine lathes have been purchased by the Carroll & Jamieson Machine Tool Co., Batavia, Ohio. The latter company will furnish repair parts and attachments for the I. H. Johnson machines.

Boston

Pig Iron Sales Decrease—Cast Pipe Prices and Extras Decline

BOSTON, Aug. 16.—Pig iron sales in New England dropped off noticeably in the past week. In the aggregate they did not exceed 6500 tons, contrasted with 25,000 tons in the previous week, and included 2000 tons of No. 2X and No. 1X for a textile machinery maker, 1000 tons of No. 1X for a Connecticut plant, 900 tons of No. 2X and No. 1X for another Connecticut foundry and numerous other lots, mostly No. 2X iron, ranging from 400 tons down to car lots. In nine cases out of ten the purchases were for fourth quarter delivery. Certain furnaces are endeavoring to secure higher prices for iron, but others continue to name low prices and it is doubtful if much iron has been sold at advanced figures. No. 2X and No. 1X were offered by Buffalo makers in the past week at $16.50 a ton, furnace, and some buyers report offers of No. 2X at $16, but it is doubtful if the latter can be done today. No. 1X iron from a furnace east of Buffalo was offered at $20, delivered at Connecticut seaboard, and the equivalent of $16 a ton, Buffalo, was done for all-rail delivery to New England points. There is not enough activity in irons from eastern and western Pennsylvania, Virginia and Alabama to give prices a real test.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.41
Buffalo, sil. 2.25 to 2.75	21.41 to 21.91
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	26.92
Virginia, sil. 2.25 to 2.75	27.42
Alabama, sil. 1.75 to 2.25	24.16 to 26.02
Alabama, sil. 2.25 to 2.75	24.66 to 26.52

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.92 from Virginia, $6.91 to $8.77 from Alabama.

Coke.—Specifications against contracts on by-product foundry coke continue to increase; yet the movement from ovens is by no means of large proportions. The New England Coal & Coke Co. and the Providence Gas Co. are billing out such fuel at $12 a ton, delivered, within a $3.10 freight rate zone. While not large, sales of foundry coke made outside New England are more frequent than heretofore. Delivered prices for such fuel are $1 to $1.50 a ton or more under those quoted by New England ovens.

Cast Iron Pipe.—Domestic pipe in 6, 8, 10 and 12-in. diameters is now generally quoted at $47.10 a ton, delivered common Boston freight rate points, while the common quotation on 16-in. and larger pipe is $46.10. These prices represent a drop of fully $2 a ton on the smaller sizes during the past fortnight, and of $1 to $2 on the larger sizes, and are the lowest quotations made during the past two years. Instead of the usual differential of $5 a ton on Class A and gas pipe, the differential today is $4. Reading, Mass., has awarded about 100 tons of 6-in. pipe to the United States Cast Iron Pipe & Foundry Co. No other municipal lettings are

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

noted. Car lot orders are fairly numerous. Foundries look for a good fall business in round tonnages.

Finished Material.—Prices for finished material are holding well. Plates are bringing 1.75c. to 1.80c. per lb., base Pittsburgh, in most cases, 1.80c.; bars are steady at 1.75c., and standard shapes are commanding 1.70c. The local market for reinforcing bars from stock is generally 2.70c. per lb., but that price is usually shaded on round tonnages. Fabricators report that low prices are being made on all round tonnages coming into the market. Most fabricators are securing many small jobs, however, on which there is a good profit.

Old Material.—Most brokers report lighter shipments of scrap than at any previous time this year. Business is confined to car lots on a basis of $10.50 to $11.50 a ton, delivered, for a majority of the most active materials, which include steel turnings, forge fire scrap, chemical borings, yard steel and cotton ties. The general range of prices paid for steel turnings is $6 to $6.25 a ton, on cars, shipping point. One car was sold last week, however, at $6.40 a ton. Cotton ties are selling at around $5.85 a ton, and yard steel, at around $6.80. More brokers are willing to pay $10 a ton, on cars shipping point, for No. 1 heavy melting steel than was the case a week ago. Prices seem to be firmer on steel mill borings, mixed borings and turnings, shafting and street car axles, without any noticeable increase in transactions.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.50 to $10.00
Scrap rails	8.00 to 8.50
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Machine shop turnings	6.00 to 6.25
Cast iron borings (steel works and rolling mill)	6.00 to 6.50
Bundled skeleton, long	6.00 to 6.50
Forged flashings	6.50 to 7.00
Blast furnace borings and turnings	6.00 to 6.25
Forged scrap	5.50 to 6.10
Shafting	13.50 to 14.00
Street car axles	16.00 to 16.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.00 to 7.50
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.00 to 10.50

Prices per gross ton delivered consumers' yards:

Textile cast	$15.00 to $15.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00 to 12.00
Railroad malleable	14.50 to 15.00

Testing Society Not to Hold Fall Group Meeting

No group meeting of committees of the American Society for Testing Materials will be held this fall. Arrangements are being made for the regular group meeting in the spring of 1928, usually held in March.

Large German Units Put To Work

The German Steel Union has just started operations at the new rolling mill at Dortmund, as well as a large new coke works. The rolling mills at Dortmund, the biggest of the concern, will produce about 56,000 tons monthly. The five new blast furnaces which have been built, replacing 11 old ones, have been just put in operation and will have a much larger production than the old ones. The five furnaces have been erected on the plants of the Dortmunder Union. Four of the furnaces are making 760 tons and one 820 tons daily.

A quantitative comparison of the tentative American, British and German national standards for metal fits is made in technologic paper No. 344 of the Bureau of Standards, prepared by Irvin H. Fullmer, associate physicist of the bureau. Each of the three national systems is briefly described, and the basis upon which the comparison is made is outlined. The fits of the American system are compared with those of the European systems having the basic hole and unilateral tolerances and comparisons are made by means of two diagrams. Recent literature relating to metal fits is listed in an appendix to the paper.

Welding Society's Meeting Program and Exposition Comprehensive

Five technical sessions have been planned for the fall meeting of the American Welding Society, which will be held at the Book-Cadillac Hotel, Detroit, Sept. 19, 20, 21, 22 and 23. There will also be a meeting of the American Bureau of Welding, the research department of the welding society, and an important feature will be the Welding and Cutting Exposition, which will be held in cooperation with the National Steel and Machine Tool Exposition. The display of welding apparatus and supplies will, it is said, be materially larger than in previous expositions under the auspices of the society. An afternoon will be devoted to inspection tours, arrangements having been made for visits to the River Rouge plant of the Ford Motor Co. and to the plant of the Fisher Body Corporation, Detroit. Entertainment features include the annual fall dinner-dance.

Papers to be presented at the first technical session on Tuesday morning, Sept. 20, are: "Airplane Welding," by J. B. Johnson, chief of the material branch, War Department, Air Corps, McCook Field, Dayton, Ohio, and "Welding on the Long Distance Aircraft," by a representative of the Curtiss Aeroplane Corporation, New York. Three papers are planned for the afternoon session, one of which, by E. E. Thum, associate editor of THE IRON AGE, is on "Heat Treatment by the Oxy-Acetylene Flame." "A Metallurgical Study of Welds," by G. R. Brophy, research laboratory, General Electric Co., Schenectady, N. Y., will be another paper at this session, and there will be discussion of a "Study of Welds Subjected to High Temperature," a report by the San Francisco section of the welding society.

"Automobile Welding," by W. C. Happ, chief engineer, department of methods and standards. Studebaker Corporation, South Bend, Ind., will be discussed by representatives of a number of automobile companies at the morning session, Sept. 21. Another paper at this session is on "Car Welding," by Victor Willoughby, general mechanical engineer American Car & Foundry Co., New York. A meeting of the Society's structural steel welding committee will be held on the evening of Sept. 21.

"Production Welding of Water Heaters," by H. J. Grow, Air Reduction Sales Co., New York, and "Welding in the Plant of the Combustion Engineering Corporation," by C. S. Reed, vice-president and general manager of the company, will be features of the first session, Sept. 22. Structural steel welding will be discussed in a paper by Joseph Matte, Jr., Albert Kahn, Inc., at the afternoon meeting, another contribution being that of L. J. Sforzini, engineering department of the Eastman Kodak Co., Rochester, N. Y., on "Welding in the Design of Steel Plate Work."

Scrap Offerings at Detroit Smallest This Year

DETROIT, Aug. 16.—The scrap market in this district has been very quiet during the past week, with no sales involving any great tonnage recorded. Releases from the largest scrap producers are the smallest for the year, but current orders are sufficiently large to consume this tonnage. Prices are unchanged.

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$12.50 to $13.00
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	17.00 to 18.00
Automobile cast	18.50 to 19.50
Hydraulic compressed sheets	11.25 to 11.75
Stove plate	11.50 to 12.50
No. 1 busheling	10.50 to 11.00
Sheet clippings	7.75 to 8.25
Flashings	10.50 to 11.00

Average weekly earnings in factories in New York State in June were $29.17, or virtually the same as in May and April. Except for last November the figure is the lowest since August, but it is higher than was ever recorded prior to last September.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Aug. 16	Aug. 15	Aug. 13	Aug. 12	Aug. 11	Aug. 10
Lake Copper, N. Y.	13.50	13.50	13.50	13.50	13.50	13.50
Electrolytic copper, N. Y.*	13.00	13.00	13.12½	13.12½	13.12½	13.12½
Straits tin, spot, N. Y.	64.37½	64.37½	....	64.75	64.75	65.00
Lead, New York	6.75	6.75	6.75	6.75	6.75	6.80
Lead, St. Louis	6.45	6.45	6.45	6.45	6.45	6.50
Zinc, New York	6.72½	6.72½	6.75	6.75	6.75	6.72½
Zinc, St. Louis	6.37½	6.37½	6.40	6.40	6.40	6.37½

*Refinery quotation; delivered price ½c. higher.

NEW YORK, Aug. 16.—Nearly all the markets are very quiet. In the absence of buying from consumers, both domestic and foreign, the copper market is tending toward weakness. Tin prices are a little lower, but buying has been active. Some detect weakness in lead and prices are a little lower. Zinc is somewhat stronger, due in part to favorable statistics.

Copper.—Producers report one of the most inactive weeks in a long time, so far as sales to both foreign and domestic buyers are concerned. It is pointed out that domestic consumers still have considerable metal to purchase for September, with some still needing August delivery. They are specifying quite fully on contracts but are very backward in making new commitments. The same situation as to export business exists now that prevailed a week ago—very little buying since the price was advanced to 13.65c. by Copper Exporters, Inc., about two weeks ago. While a number of large producers today are still quoting electrolytic copper at 13.37½c., delivered in the Connecticut Valley, the metal is available as low as 13.25c. or even slightly lower and the nominal quotation is 13.25c. Statistics for July appeared last Friday, Aug. 12, and were neither favorable nor unfavorable, or in other words they could be interpreted in a moderate way in either direction. The July data showed that copper as stocks in the refined and blister form had decreased only about 1000 tons from June, and it was also indicated that mine production had declined in July about 10 per cent from June. For example, the mine production for 1925 was about 2307 tons per day and about 2390 tons per day in 1926. From a daily rate in January, 1927, of 2458 tons per day, the production has declined to 2318 tons per day in June and to 2114 tons per day in July. While this is a fairly large reduction in output, its cumulative effect will not be felt for some little time in the market for refined metal. By some producers the situation as a whole is regarded as favorable and the lull in the market as only temporary. Lake copper is quoted at 13.50c., delivered.

Tin.—Sales for the week ended with Saturday, Aug. 13, amounted to 1300 to 1400 tons. Consumers were fairly large buyers, and their purchases ran well into the future. Some of the larger tin plate makers are said to have been buyers of August-September metal last Thursday, presumably to fill in a gap. Yesterday, Monday, the market was active, with 500 tons changing hands, mostly for October-November delivery, practically all taken by dealers. Today, Tuesday, there has been considerable inquiry, and the market has been fairly active, with spot Straits tin quoted at 64.37½c., New York. In London today quotations were about £3 per ton less than a week ago, with spot standard tin quoted at £293 10s., future standard at £285 10s. and spot Straits at £297 per ton. The Singapore price today was £292 10s.

Lead.—An easier tone pervades the market. Some say it is decidedly easier, and the opinion of a large consumer is to the effect that it is weak. There is an expectation that the leading interest will soon reduce its official quotation, which still stands 6.75c., New York, as the contract price. Quotations are a little lower in the outside market, with independents quoting 6.45c. St. Louis, and 6.75c., New York. The well

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	66.50c. to 67.50c.
Tin, bar	68.50c. to 69.50c.
Copper, Lake	14.75c.
Copper, electrolytic	14.50c.
Copper, casting	14.00c.
Zinc, slab	7.75c. to 8.75c.
Lead, American pig	8.00c. to 9.00c.
Lead, bar	10.00c. to 11.00c.
Antimony, Asiatic	14.00c. to 15.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	41.50c. to 42.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	69.25c.
Tin, bar	72.25c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc slab	7.75c.
Lead, American pig	7.75c.
Antimony, Asiatic	18.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	21.75c.
Babbitt metal, high grade	75.50c.
Solder, ½ and ½	40.00c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.25c. to 19.00c.
Copper, hot rolled	22.00c. to 23.00c.
Copper, cold rolled, 14 oz and heavier	24.25c. to 25.25c.
Seamless Tubes—	
Brass	23.12½c. to 24.12½c.
Copper	24.00c. to 25.00c.
Brazed Brass Tubes	26.25c. to 27.25c.
Brass Rods	16.00c. to 17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not changed since the advance of Aug. 3. Zinc sheets are still quoted at 10c., and lead full sheets are unchanged at the advance of July 30.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.25c.
Copper, hot rolled	22.00c.
Zinc	10.00c.
Lead (full sheets)	10.25c. to 10.50
Seamless Tubes—	
High brass	23.12½c.
Copper	24.00c.
Rods—	
High brass	16.00c.
Naval brass	18.75c.
Wire—	
Copper	15.25c.
High brass	18.75c.
Copper in Rolls	21.00c.
Brazed Brass Tubing	26.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	22.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c.
Zinc	11.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	24.62½c.
Copper	25.50c.
Brazed Brass Tubes	28.50c.
Brass Rods	16.00c.

bought-up condition of consumers is considered as one cause of the weakness.

Zinc.—For the first time in many months, statistics of production were favorable, and this fact has tended to firm up the market slightly. July data showed a decrease in refined stocks of zinc of something less than 5000 tons, according to statistics which were published Aug. 10. Buying and inquiry are by no means large, but some business is reported almost every day, some transactions being made yesterday and today at 6.37½c. and 6.40c., St. Louis, which we quote as the market range today. Producers are generally in a comfortable position, and the outlook as a whole is by no means dark.

Antimony.—Chinese metal for spot delivery is quoted at 12c., New York, duty paid, for all positions with the market exceedingly quiet.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

AUG. 16.—This market, especially in lead and zinc, is quiet, and prices for these two commodities and tin are lower. The copper price is unchanged in the absence of large tonnage buying. The old metal market is without a feature.

Prices, per lb., in carload lots: Lake copper, 13.50c; tin, 66.50c.; lead, 6.60c.; zinc, 6.50c.; in less-than-carload lots, antimony, 14c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13.25c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

The Erie Railroad has ordered 25 passenger cars from the Pressed Steel Car Co.

The Southern Pacific is inquiring for six postal cars.

Increase in Sheet Sales

PITTSBURGH, Aug. 16.—Independent sheet steel makers reporting to the National Association of Sheet and Tin Plate Manufacturers, with total sales of 230,715 net tons last month, bettered their record for June by more than 6000 tons. The shipments for the month at 252,034 tons, however, were almost 30,000 tons less than those for June. Production in July at 237,243 tons was down more than 63,000 tons from that of the previous month. Unfilled orders at the end of July were 353,413 tons, a decrease as compared with one month before of 46,149 tons.

July shipments ran almost 22,000 tons ahead of sales, and almost 15,000 tons in excess of production. Unshipped stocks at the end of July were 109,836 tons, compared with 120,295 tons at the end of June, and unsold stocks at the end of July were 44,538 tons, compared with 47,860 tons a month before.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.25c.	13.00c.
Copper, heavy and wire	11.00c.	12.00c.
Copper, light and bottoms	9.50c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.25c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.75c.	8.375c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.50c.	6.00c.
Lead, tea	4.50c.	5.00c.
Zinc	4.00c.	4.50c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

REINFORCING STEEL

Awards of 7860 Tons Include Three 1000-Ton Jobs—Inquiries Very Low

Awards of concrete reinforcing bars, as reported to THE IRON AGE in the last week, totaled 7860 tons. An automobile service station in New York, a warehouse in Buffalo and an apartment building in Chicago took 1000 tons each. New inquiries, aggregating only 825 tons, were at the lowest level in several months. Awards follow:

CAMBRIDGE, MASS., 110 tons, aeronautical laboratory, Massachusetts Institute of Technology, to Edward A. Tucker Co.

NEW YORK, 1000 tons, Cadillac Service Station, Columbus Avenue and Sixty-second Street, to Jones & Laughlin Steel Corporation.

BROOKLYN, 600 tons, sewer, from the Necaro Co., Inc., general contractor, to Concrete Steel Co.

BUFFALO, 550 tons, convent, to Barton Spiderweb System.

BUFFALO, 1000 tons, warehouse for Terminals Transportation Corporation, to a Buffalo maker.

BUFFALO, 100 tons, Wettlaufer garage, to a Buffalo maker.

BUFFALO, 100 tons, City Courts building, to a Buffalo maker.

BUFFALO, 400 tons, Section No. 5, Scajaquada Creek drain for city of Buffalo, to a Buffalo maker.

PITTSBURGH, 150 tons, David B. Oliver High School and Cathedral of Learning, University of Pittsburgh, to Electric Welding Co., Pittsburgh.

NEW CASTLE, PA., 175 tons, high school building, to Concrete Steel Co.

GALLIPOLIS, OHIO, 100 tons, hotel, to Concrete Steel Co.

CHICAGO, 1000 tons of rail and billet steel, apartment building, to Barton Spiderweb System.

CHICAGO, 400 tons of rail steel, apartment building on Fullerton Parkway, to Inland Steel Co.

CHICAGO, 300 tons of rail steel, apartment building on Lakeside Place, to Inland Steel Co.

CHICAGO, 110 tons, apartment building, to Concrete Engineering Co.

SEATTLE, WASH., 275 tons, Mayflower Theater, to Northwest Steel Rolling Mills, Inc., Ballard, Wash.

OLYMPIA, WASH., 135 tons, paving work for State Highway Commission, to an unnamed jobber.

OLYMPIA, WASH., 180 tons, six bridges for State Highway Commission, to unnamed companies.

TUCSON, ARIZ., 325 tons, hotel building, to an unnamed company.

OAKLAND, CAL., 350 tons, garage building for Lloyd Brothers on Fourteenth Street, to an unnamed San Francisco jobber.

LOS ANGELES, 500 tons, Drainage District No. 20 for city, to an unnamed local jobber.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 200 tons, Hyde Park school.

BOSTON, 125 tons, Burdett Business College building.

CHICAGO, 500 tons, Milliners' Building; Dailey Constructions Co., sub-contractor.

Mechanical stokers sold in July are reported by the Department of Commerce at 136, aggregating 41,504 hp. Except for April, this is the lowest horsepower total since February. It compares with 54,804 in June and with 50,494 in July, 1926. The average month of 1926 showed 45,519 hp.

FABRICATED STRUCTURAL STEEL

Hudson River Bridge Will Require 150,000 Tons —Other New Projects Total 33,400 Tons

A bridge across the Hudson River at New York, requiring approximately 150,000 tons, is the outstanding new project of the week. Also included in the 183,400 tons of new business pending are 6000 tons for a Chicago hotel, 5300 tons for club building in New York and 4000 tons for a bridge across the Ohio River at Paducah, Ky. Included in the 27,000 tons of business placed is 6000 tons for a section of the Philadelphia subway. Awards follow:

MALDEN, MASS., 100 tons, Kresge store, to A. L. Smith Iron Works.

CHELSEA, MASS., 100 tons, theater, to Palmer Steel Co.

NEWTON, MASS., 810 tons, hospital, to New England Structural Co.

FALL RIVER, MASS., 440 tons, pulverizer house conveying bridge, to Palmer Steel Co.

STAMFORD, CONN., 550 tons, building for Stamford Gas & Electric Co., to an unnamed fabricator.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD, 250 tons, bridges, to American Bridge Co.

NEW YORK, 2300 tons, unit No. 4 of Tudor City development at East Forty-second Street, to Harris Structural Steel Co.

NEW YORK, 450 tons, 9-story apartment building at 207-211 Lincoln Place, to Dreier Iron Works.

LONG ISLAND CITY, N. Y., 650 tons, pasteurizing plant for Borden's Farm Products Co., Inc., to Taylor-Fichter Steel Construction Co.

UTICA, N. Y., 800 tons, theater, to Harris Structural Steel Co.

EAST ORANGE, N. J., 450 tons, Church Apartments, to American Bridge Co.

READING RAILROAD, 300 tons, two bridges at Sellersville, Pa., to American Bridge Co.

PHILADELPHIA, 6000 tons, steel for section of Broad Street subway; Hyman & Goodman Co., New York, general contractor, to American Bridge Co.

PHILADELPHIA, 300 tons, Girard College high school, to Bethelem Fabricators, Inc.

PHILADELPHIA, 700 tons, school, to McClintic-Marshall Co.

ALTOONA, PA., 900 tons, high school, to Jones & Laughlin Steel Corporation.

RIDGWAY, PA., 100 tons, Elliott Co. plant extension, to Fort Pitt Bridge Works.

VIENNA, MD., 400 tons, work for Delmarva Power Co. of Baltimore, to Dietrich Brothers.

LOUISVILLE, KY., 700 tons, Loew's Theater, to Rochester Bridge Co., Rochester, Ind.

LEXINGTON, KY., 235 tons, McNey Hall for University of Kentucky, to Massillon Bridge & Structural Co.

DAYTON, OHIO, 300 tons, Rosedale Avenue bridge, to E. R. Smith, Indianapolis.

COLUMBUS, OHIO, 700 tons, Beggs Building, to Mount Vernon Bridge Co.

LORAIN, OHIO, 220 tons, theater, to Massillon Bridge & Structural Co.

DETROIT, 250 tons, addition to Herman Kiefer Hospital, to Massillon Bridge & Structural Co.

GARY, IND., 560 tons, public building, to American Bridge Co.

DOWNERS GROVE, ILL., 140 tons, high school, to Gage Structural Steel Co., Chicago.

CHICAGO, 295 tons, commercial building, to an unnamed fabricator.

OGDEN, UTAH, 300 tons, bridge for Union Pacific Railroad, to American Bridge Co.

EUGENE, WASH., 250 tons, telephone building, to Hofius Steel & Equipment Co.

BREWSTER, WASH., 300 tons, pulp mill, to an unnamed fabricator.

UKIAH, CAL., 180 tons, transmission towers for Snow Mountain Water & Power Co., to Pacific Coast Steel Co.

SAN FRANCISCO, 2500 tons, hotel building at Sutter and Powell Streets, for the Huckins Hotels System, Oklahoma City, Okla., to Pacific Rolling Mill Co., Inc.

SAN FRANCISCO, 1800 tons, Hymann Building, to American Bridge Co.

LOS ANGELES, 2700 tons, Anthony Building, to Llewellyn Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 470 tons, Burdett Business College building.

BOSTON, 185 tons, Temple Israel school.

NEW YORK, 150,000 tons, Hudson River bridge, from Fort Washington, N. Y., to Fort Lee, N. J.; bids called for by Port Authority of New York for Oct. 3.

NEW YORK, 5300 tons, Woman's Club, 353-361 West Fifty-seventh Street.

NEW YORK, 1375 tons, office building, 18-22 East Forty-eighth Street.

NEW YORK, 1000 tons, addition to Fordham Hospital.

NEW YORK, 500 tons, garage, 101st Street and Broadway.

NEW YORK, 470 tons, apartment building 244-48 West Seventy-second Street.

NEW YORK, 200 tons, 2-story business building, Fordham Road.

BROOKLYN, 850 tons, settlement house, Avenue B and East Ninth Street.

SYOSSET, N. Y., 850 tons, convent.

NEWARK, N. J., 100 tons, building for Firemen's Insurance Co.

CAMDEN, N. J., 700 tons, vocational school.

PHILADELPHIA, 3000 tons, Linden Avenue bridge.

PHILADELPHIA, 1500 tons, Y. M. C. A. building.

MONMOUTH COUNTY, PA., 400 tons, Matawan Creek bridge.

PENNSYLVANIA RAILROAD, 300 tons, several bridges.

BALTIMORE, 200 tons, building for Central Fire Insurance Co.

PADUCAH, KY., 4000 tons, bridge across Ohio River.

JACKSON, MICH., 1400 tons, Elks Club.

CHICAGO, 6000 tons, Bryn Mawr Beach Hotel.

CHICAGO, 1800 tons, bridge across Calumet River.

CHICAGO, 1700 tons, office building for DePaul University.

CHICAGO, 400 tons, Englestein Building.

CHICAGO, tonnage not stated, Polk Street High School.

CHICAGO, tonnage being estimated, Harrison Street High School.

TACOMA, WASH., 900 tons, pipe line; Birchfield Boiler Works, Portland, Ore., low bidder on steel pipe.

SAN FRANCISCO, 500 tons, Dreamland Boxing Arena, Post and Steiner Streets.

OAKLAND, CAL., 325 tons, building for Mutual Stores, East Fourteenth and Fifty-fourth Streets; bids in.

Large Increase in Production of Secondary Metals in 1926

The recovery of certain metals from secondary sources in 1926 is reported to the United States Bureau of Mines as having a value of $274,540,900, which is $30,970,200 more than in 1925. This large increase, according to J. P. Dunlop, who compiled the figures, occurred notwithstanding a lower yearly average price for all the metals covered in the inquiry other than for tin and nickel. The increases in the recoveries of copper, brass, lead, and antimony were very large.

The smelters that treat mainly ore recovered 112,559 tons of copper from scrap, which was 13,000 tons more than in 1925. Part of the increase of 28,500 tons of copper in brass was due to the decrease of the exports of brass from 48,189 tons in 1925 to 25,132 tons in 1926.

The smelters that treat mainly ore recovered about 3000 tons less lead from scrap and drosses than they did in 1925, but the secondary smelters recovered about 15,000 tons more lead. The increased quantities of battery plates from motor cars probably accounts for most of this large increase, though the regular smelters reported an increase of more than 2000 tons of lead in antimonial lead scrap.

Zinc recovered by redistillation increased more than 1600 tons, and that recovered by sweating and remelting, more than 1500 tons. The largest increase in zinc was that obtained from scrap alloys. The quantities of lithopone, zinc dust and zinc chloride made from drosses and skimmings were considerably less in 1926 than in 1925, and the exports of zinc dross declined about 5500 tons.

The secondary tin recovered increased about 2400 tons, owing partly to the treatment of large quantities of old cans and tin plate clippings. Tin plate clippings treated increased 22,000 gross tons, and old cans treated, more than 10,700 gross tons. Most of the old cans were handled by a new plant at Los Angeles.

The quantity of secondary nickel recovered increased considerably, which was expected with the increased use of nickel non-ferrous alloys. Recoveries of secondary antimony increased 73 per cent, while the reported recoveries of secondary aluminum in 1926 were about equal to those of 1925.

Living costs are lower than they were last year, according to figures of the Bureau of Labor Statistics. The general level in June was 0.8 per cent below that of June, 1926, and was 1.3 per cent below that of December, 1926. It remains 73.4 per cent above 1913.

PERSONAL

Frank R. Meyer, Jr., St. Louis district manager for the Inland Steel Co., Chicago, has been appointed assistant vice-president in charge of sheet steel sales, succeeding Walter C. Carroll, vice-president, who resigned Aug. 1 to become president of the National Association of Sheet and Tin Plate Manufacturers.

FRANK R. MEYER, JR.

WALTER F. BRUMM

Mr. Meyer began his business career with the Standard Stamping Co., leaving that concern after 16 years to represent various steel companies in St. Louis. He became affiliated with the Inland company in 1911 and was made St. Louis district sales manager on Jan. 1, 1919.

Walter F. Brumm, formerly assistant sales manager at St. Louis for the Inland company, has been appointed district sales manager. He entered the steel business as a stenographer in the St. Louis office of the Pittsburgh Steel Co. Two years later he was given a territory in southern Illinois and subsequently represented that company in the Northwest, with headquarters at St. Paul. He resigned in 1914 to go with the Cambria Steel Co., and represented that company and its successor, the Midvale Steel & Ordnance Co., in the Kansas City district until its absorption by the Bethlehem Steel Corporation in 1923. He then took a position with the National Enameling & Stamping Co., becoming associated with the Inland company on Feb. 1, 1925.

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Daniel W. Northup has been elected president and general manager of the Henry G. Thompson & Son Co., New Haven, Conn., manufacturer of metal cutting saws and saw machines, succeeding D. C. Smyth, who has been elected treasurer of the company. Mr. Northup was associated for 25 years with the Bassett Metal Co., Inc., Shelton, Conn., in the last 10 of which he was vice-president.

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H. A. Adams, Jr., for the last seven years manager in India for the Walworth International Co., New York, has returned to this country and will maintain temporary headquarters at room 605, 44 Whitehall Street, New York. He has been identified with the exportation of engineering material for a number of years and, before going with the Walworth organization, was with the Allied Machinery Co.

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W. R. Bean, for the last 11 years research engineer for the Eastern Malleable Iron Co., Naugatuck, Conn., has been appointed vice-president and consulting engineer for the Grindle Fuel Equipment Co., Harvey, Ill., subsidiary of the Whiting Corporation. He received his engineering training at the Virginia Polytechnic Institute and was later a special apprentice in mechanical engineering for the Atlantic Coast Line Railroad. For 12 years he was associated with the Symington Co., Rochester, N. Y., serving first as inspector and finally as works manager in charge of foundries at Rochester and Corning, N. Y. In 1913 he was engaged in consulting and report work on foundries and the following year served as a sales engineer for pulverized coal installations on furnaces and boilers. In 1921-22 he was president of the American Foundrymen's Association, having served previously as a director and vice-president.

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William E. Brown, manager of the central station department of the New York district of the General Electric Co., has been appointed New York district sales manager of the company, with headquarters at 120 Broadway.

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H. B. Ackland has been appointed New York district manager for the G. H. Williams Co., Erie, Pa., with headquarters at 30 Church Street. He has previously represented the company in both the New York and New England districts, and for a number of years was identified with Dwight P. Robinson & Co., Inc., New York. He succeeds E. L. Sparks, who has removed to the Pacific Coast. C. F. Weiblen has been appointed direct factory representative in Ohio for the Williams company and will maintain headquarters at Cleveland.

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G. L. Fisk, who has been appointed chief engineer of the Mesta Machine Co., Pittsburgh, was recently chief engineer of the Pittsburgh Crucible Steel Co., Midland, Pa., where he was in charge of engineering, construction and maintenance of the Midland plant, as well as of major engineering projects and installations of the Crucible Steel Co. of America. Mr. Fisk was educated in Sweden and for a time was associated with the Cambria Steel Co., Johnstown, Pa. Later he served as resident engineer for Julian Kennedy, Sahlin & Co., Ltd., during the construction of the plant of the Tata Iron & Steel Co. in India. L. Iversen, vice-president of the Mesta company, whom Mr. Fisk succeeds, will continue with the organization in the capacity of consulting engineer.

G. L. FISK

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R. H. Newton has been appointed factory representative in the New England, New York, Pennsylvania and West Virginia territory of the Chain Products Co., Cleveland.

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F. M. Young, organizer and formerly vice-president and general manager of the Racine Radiator Co., Racine, Wis., has formed the Young Radiator Co., also of Racine, which will manufacture heavy duty radiators for use on buses, tractors, trucks, power units, etc. The new company is made up of Mr. Young's former engineering and shop personnel.

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Charles A. Perryman, formerly sales manager of the wire rope department of the Wickwire Spencer Steel Corporation, is now associated with the American Cable Co. as assistant sales manager. He will make his headquarters at 105 Hudson Street, New York.

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E. Arthur Tutein, of E. Arthur Tutein & Co., Inc., Boston and New York, sailed last week for Europe.

Alfred H. Bartsch, general sales manager American Bosch Magneto Corporation, has resigned and been appointed sales and advertising manager of the General Motor Corporation in Australia, Tasmania and New Zealand.

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G. W. McIntyre, for many years in the sales department of the Niles-Bement-Pond Co., New York, has become connected with the Reed-Prentice Corporation, Worcester, Mass., in the sale in the Eastern territory of the Wolf portable link sawing machine.

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H. H. Straus, recently appointed vice-president of the Inland Steel Co., Chicago, will sail on Aug. 18 for a six weeks' vacation in Europe.

Americans to Contribute to International Management Congress

American representation to the Third International Management Conference, to be held in Rome, Italy, Sept. 5 to 10, will be headed by Morris L. Cooke, consulting engineer, Philadelphia, and Henry C. Dennison, president of the Dennison Mfg. Co., Framingham, Mass. R. T. Kent, general manager of the Bridgeport Brass Co., is chairman of the American committee, which is the official liaison body coordinating management developments in the United States with those in other countries. Premier Mussolini is honorary chairman of the conference.

Among those contributing papers are Charles R. Hook, American Rolling Mill Co., and John G. Aldrich, president of the New England Butt Co., Providence, R. I.

"National Metal Week" at Detroit

Because of the meetings of four technical associations in Detroit in conjunction with the ninth annual National Steel Exposition, the week of Sept. 19 is to be observed as "National Metal Week," particularly in industries producing and interested in iron, steel and other metals.

Simultaneously with this announcement, the secretary of the American Society for Steel Treating, which is sponsoring the exposition, states that the show spaces at the exposition have been practically exhausted. Only five remain unassigned, and there is every reason to believe that demand will exceed the supply.

The decision to designate the days of the exposition as National Metal Week resulted from a realization that the meetings in Detroit of the American Society for Steel Treating, the American Welding Society, the Institute of Metals and the Society of Automotive Engineers will produce one of the most significant exchanges of ideas, processes, theories and developments ever held in this country.

The war memorial scholarships of the Westinghouse Electric & Mfg. Co., established in memory of the Westinghouse employees who lost their lives in the World War, and carrying a fund of $500 a year for a period of four years, have been awarded to H. L. Bunker, Jr., son of H. L. Bunker, rate setter, East Pittsburgh works, who will attend the Carnegie Institute of Technology; P. J. Glaister, tester, East Pittsburgh works, who will attend Cornell University; M. T. Ayres, son of M. C. Ayres, foreman of dial markers, Newark works, who will attend the Massachusetts Institute of Technology, and A. L. Kine, son of R. R. Kine, salesman, New York office, who will attend Princeton University. This brings the total number of scholarships awarded since the establishment of the plan to 32. There have been 18 graduations, while 11 students are still enjoying the assistance of the scholarships.

Freight traffic in the first half of 1927 is reported by the Bureau of Railway Economics as the greatest on record. The aggregate of 233,794,568,000 net-ton-miles was an increase of 3 per cent over the corresponding period of last year—the previous high record.

OBITUARY

DR. ALEXANDER CROMBIE HUMPHREYS, president emeritus of the Stevens Institute of Technology, Hoboken, N. J., and one of this country's eminent engineers, died on Aug. 14 at his home in Morristown, N. J. He was born at Edinburgh, Scotland, on March 30, 1851, and received his early training in his father's private school. He began his business career at the age of 14, and from 1872 until 1881 was secretary and superintendent of the Bayonne & Greenville Gas Light Co. During the last years of this period he was also studying mechanical engineering at the Stevens Institute, and was graduated in 1881. He then became chief engineer of the Pintsch Lighting Co., New York, where he remained until 1885. From that company he went to the United Gas Improvement Co., Philadelphia, as general superintendent and chief engineer. In 1892 he helped to organize the engineering firm of Humphreys & Glasgow, New York and London. He retired from the London branch of this concern in 1908, but two years later, reorganized the New York branch as Humphreys & Miller, Inc., of which he was president. He returned to Stevens as president in 1902 and in 1907, was made president of the board of trustees. His retirement as the active head of the school was announced at the commencement exercises last June. Dr. Humphreys was the author of "Some of the Business Features of Engineering Practice," 1905, and of numerous papers and articles on engineering education, depreciation, engineering accountancy, appraisals and methods and economies of gas engineering. He was a director of the Electric Storage Battery Co., Philadelphia, a director and member of the finance committee of the Equitable Life Assurance Society, New York, and a director of the First National Bank of Hoboken. He was a past president of the American Society of Mechanical Engineers, the United Engineering Society, the National Society for the Promotion of Engineering Education, the Canadian Society, the St. Andrew's Society, the American Institute of Construction Engineers and of the Engineers Club of New York. He held membership in the American Society of Civil Engineers, the American Institute of Electrical Engineers, the American Institute of Mining and Metallurgical Engineers, the Institution of Civil Engineers of Great Britain and in numerous social organizations.

DR. A. C. HUMPHREYS

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CHARLES W. GUTEKUNST, for the past several years estimator and engineer for the Henesey-Mann Structural Co., Inc., Buffalo, died on Aug. 8, following an illness of several months.

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CHARLES F. BAXTER, SR., of the Baxter Foundry & Machine Works, Boise, Idaho, died suddenly on June 24.

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ERNEST B. PERRY, president of the Industrial Works, Bay City, Mich., died at his home in that city on Aug. 7, following a week's illness. He was born at Prairie Du Chien, Wis., in 1868 and attended the public schools of Ann Arbor, Mich. He was graduated from the University of Michigan in 1889 and in 1896 received his master's degree in mechanical engineering from the same university. His first association with the Industrial Works was in 1889 as a draftsman, and

two years later he was made superintendent and mechanical engineer. Later he became vice-president and general manager and, in 1924, was made president of the company. While in college he was a member of Tau Beta Pi, honorary engineering fraternity. He was a member of the American Society of Mechanical Engineers.

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FREDERICK L. CONVERSE, for the last five years consultant on engineering problems and power plant operation for W. B. Coleman & Co., Fifteenth and Wallace Streets, Philadelphia, metallurgists, chemists and engineers, died on Aug. 9, following a brief illness. He was a graduate of Purdue University and began his engineering career in a New York generating station. Later he was made steam engineer of the Coatesville, Pa., plant of the Midvale Steel Co., and many of the power changes at this plant were made under his supervision. At the time of the war he had entire charge of the construction of the boiler plant and steam equipment at this plant, and later took an active part in the construction and operation of works of the Tacony Ordnance Corporation, a plant which was built by the Government for the manufacture of the 155-mm. field gun and the 240-mm. howitzer. He was also associated for some time in a consulting capacity for the du Pont interests.

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MARSHALL BURNS LLOYD, inventor of labor-saving machinery, died at his home in Menominee, Mich., on Aug. 10, aged 70 years. Among the many inventions to his credit, the most successful probably was a machine for manufacturing thin seamless steel tubing. His best known work was a loom for weaving wicker for furniture and baby carriages. Patent rights and his Menominee plant for manufacturing the carriages were sold to the Heywood-Wakefield interests several years ago.

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JAMES C. FERRIS, formerly vice-president in charge of all production for the Simmons Co., New York, died in Chicago on Aug. 5, aged 54 years. He entered the Simmons plant at Kenosha, Wis., in 1895 as a buffer and was promoted steadily, becoming general superintendent in 1916, vice-president and general production manager in 1917, and vice-president and director of sales, advertising and service in 1924. He had retired a year ago to devote his attention to private interests.

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CHARLES C. KAGEL, senior member of the Kagel Brothers Co., brass founder, Milwaukee, died Aug. 6, aged 55 years.

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SAMUEL A. MCCOOL, manager of the Davenport, Iowa, branch of the Crane Co., Chicago, died suddenly on Aug. 11 in a hospital at Sterling, Ill. He had gone to that city for a conference with the company's other managers. He was 53 years of age.

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CHARLES F. COX, president Cox & Sons Co., Bridgeton, N. J., manufacturer of pipe cutting and threading machines, died Aug. 14 at his home at Bridgeton, following a three months' illness. He was 65 years old. Mr. Cox was well known in manufacturing circles in Philadelphia and in southern New Jersey. He was trustee and treasurer of the Manufacturers' Association of New Jersey. He was a member of the Manufacturers' Club and Union League of Philadelphia.

Production of bituminous coal in the United States has at last fallen behind last year. The total to Aug. 6 is reported by the Bureau of Mines at 318,778,000 net tons, against 319,309,000 tons a year ago. In spite of the strike, the total for this year at the date a week earlier was ahead of last year. Production for the week ended Aug. 6 was 8,494,000 tons, against 10,150,000 tons a year ago.

Production of motor cars has been accelerated rapidly in the last few weeks, according to *Automotive Industries*, and indications are that the August total will be close to the highest mark of the year for the companies exclusive of Ford, if, indeed, the best previous month of 1927 is not exceeded.

New Mechanical Cast Iron Pipe Process Developed

BIRMINGHAM, Aug. 16.—The McWane Cast Iron Pipe Co. announces the development of its own system of manufacturing a sand-cast pipe which, it is claimed, will compete with the other lighter-weight pipe being put on the market. The company is increasing its preferred capitalization from $500,000 to $1,000,000, though the entire issue will not be sold at once.

In the developments under way mechanical operations will be substituted for the hand methods that have been used in the initial stages. Experimental work on these mechanical features has been in progress for some time, and it is stated the success of these experiments has justified going ahead with these improvements in a large way. As a result of these new installations, the tonnage of the plant will be practically doubled and the length of the pipe made in the new mechanical unit will be 15 ft. The range of sizes heretofore made will also be increased and pipe as large as 12 in. in diameter will be made by the new process.

To Receive Rudolph Diesel Award for 1927

Announcement is made that W. F. Joachim, mechanical engineer Langley Memorial Aeronautical Laboratory, has been selected to receive the Rudolph Diesel award for 1927, consisting of a suitable certificate and a cash prize of $100 for his paper entitled "Oil Spray Investigations" of the National Advisory Committee for Aeronautics, which was presented at the Oil Power Week meeting, April 21-23, at Pennsylvania State College, State College, Pa.

The committee of award consisted of F. Thilenius, division superintendent Prairie Pipe Line Co., F. G. Hechler, professor of engineering research, Pennsylvania State College, and R. Miller, assistant chief engineer oil engine department Ingersoll-Rand Co.

Opposed Holes Ground Simultaneously

(*Concluded from page* 407)

the front of the machine, which also starts and stops the water supply.

The cross-slide, which is under the workhead, is arranged with a coarse and fine feed, automatically operated. On this unit is the control for the truing and sizing operations. This consists mainly of a cam and two contact points; the first permits the current from a generator on the back of the machine to energize a magnet in the magnet box on the front which operates the lever that controls the sliding dog, allowing the stroke of the tables to be amplified for the wheel truing operation. The second contact directs the current in a second magnet which operates the lever that lifts the pawl allowing the tables to go to rest position as the work comes to size.

There is also an arrangement on the cross-slide which automatically advances it sufficiently to compensate for the wheel wear to assure that a slight amount of stock will be trued from the wheels each time the diamonds are dropped into position.

The wheel-truing devices are located at the rear of the workhead unit and move with the workhead in all its crosswise movements. A micrometer adjustment by a convenient knob allows for in-and-out movements of the diamonds in tenths of thousandths for accurately controlling the size of the finished holes.

The rear shaft of the machine is mounted in antifriction bearings and is direct connected to a 5-hp. motor. It drives the oil pump generator, workhead and water pump. The standard machine also includes two 3-hp. wheelhead motors. The base of the machine at the floor measures 30¾ x 108 in., and the floor space occupied with tank is 60 x 108 in. The distance from the floor to the center of the workhead spindle is 45 in. The weight of the machine net is 8500 lb.

European Steel Markets Spotty

Quiet in Great Britain and Weakness in Luxemburg Contrasts with German Activity

(*By Cablegram*)

LONDON, ENGLAND, Aug. 15.

AS the Cleveland district is in the midst of a holiday week now in progress, business consequently is restricted. Practically all steel works and foundries in that district are closed. The outlook is uncertain, but the position of British foundry pig iron makers has been strengthened by a rise in Continental pig iron prices. Hematite producers are making a stand at present levels, which are below cost. There are some signs of expansion in demand.

Foreign ore is still quiet, but the works are showing more interest in early deliveries of Spanish grades.

There is slightly more business moving in finished iron and steel, but the total is still restricted. The shipyards are busy on material delivered, but are not inclined at present to make fresh purchases. The engineering branches also are well occupied. No price changes are likely to occur before the meeting of the Steel Association in September.

July exports of pig iron amounted to 25,810 tons, of which 3093 tons went to the United States. Exports of all kinds of iron and steel in July aggregated 389,647 tons.

Demand for tin plate is still improving, as buyers realize that prices are likely to advance soon. The undertone consequently is firmer. Improvement in actual business is slow. The galvanized sheet market is more cheerful and there is better demand, mainly for small lots. Most makers are comfortably booked, and prices manifest an upward tendency. Black sheets are quiet, as the Far Eastern interest has dwindled, but makers are well booked.

The Continental market is firmer, but this fact is not justified by the sales position here.

Summer Quiet Rules in Britain

LONDON, ENGLAND, Aug. 5.—Quiet conditions generally have prevailed throughout the iron and steel trade during the past fortnight, and little change is expected now until the holiday period is ended. The volume of business in general has of late been on a poor scale, the lack of buying being attributed to high prices.

Cleveland producers still maintain their iron on the basis of £3 10s. ($16.93) for No. 3 G.M.B., which figure is fully 10s. above that at which Continental iron is being sold to this country, f.o.b. Antwerp. Many thousands of tons of foreign iron have been bought since the beginning of our coal strike last year, but the imports of such material are now declining. Nevertheless they are still of sufficient volume to cause grave concern to British producers. Pease & Partners have decided to put two blast furnaces at the Tees Bridge Ironworks out of commission, to ease the position.

In hematite also there has not been any fresh development, but, owing to the fact that makers of East Coast hematite are not bound by any price ring, the sales of this material have been considerably better than have those of foundry iron, makers being able to name their own quotations. These latter have steadily declined and now stand at about £3 15s. 6d. ($18.25) for mixed numbers, either f.o.t. for the home trade or f.o.b. for shipment overseas. One or two good lines have been sold to Continental users, but the home demand is restricted by the limited call from the steel trade.

In manufactured iron and steel, as in pig iron, quiet conditions have continued, and apart from a few electrical works' contracts and Colonial Government orders, little important business has been moving. Plate rollers in particular have only a few orders on their books, but there is a moderate amount of activity in the sectional mills. From time to time new shipbuilding contracts are placed, but it is some weeks now since

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, del'd.	£0	19s.				$4.60		
Bilbao Rubio ore†	1	1	to £1	1¼s.		5.09	to	$5.15
Cleveland No. 1 fdy.	3	12½				17.57*		
Cleveland No. 3 fdy.	3	10				16.97*		
Cleveland No. 4 fdy.	3	9				16.73*		
Cleveland No. 4 forge	3	8½				16.61*		
Cleveland basic	3	15	to	3	15½	18.18	to	18.30
East Coast mixed	3	15½				18.30		
East Coast hematite	3	16				18.42		
Rails, 60 lb. and up.	7	15	to	8	0	37.58	to	38.80
Billets	6	0	to	6	10	29.10	to	31.53
Ferromanganese	12	0				58.20		
Ferromanganese (export)	10	15	to	11	0	52.13	to	53.35
Sheet and tin plate bars, Welsh	5	12½	to	5	15	27.27	to	27.88
Tin plate, base box	0	18⅜	to	0	18⅝	4.46	to	4.52
Black sheets, Japanese specifications.	13	15				66.68		
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.65	to	1.76
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.76	to	1.87
Channels	7	7½	to	7	17½	1.60	to	1.70
Beams	7	2½	to	7	12½	1.54	to	1.65
Round bars, ¾ to 3 in.	7	12½	to	8	2½	1.65	to	1.75
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	5	to	10	10	2.22	to	2.28
Galv. sheets, 24 gage	13	15	to	14	0	2.98	to	3.03
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.03	to	3.09

*Export price, 6d. (12c.) per ton higher.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	0s.	to	£3	1s.	$14.55	to	$14 79
France	3	0	to	3	1	14.55	to	14.79
Luxemburg	3	0	to	3	1	14.55	to	14.79
Basic pig iron:								
Belgium	2	19	to	3	0	14.31	to	14 55
France	2	19	to	3	0	14.31	to	14.55
Luxemburg	2	19	to	3	0	14.31	to	14.55
Coke	0	18				4.37		
Billets:								
Belgium	4	6				20.85		
France	4	6				20.85		
Merchant bars:						C. per Lb.		
Belgium	4	14				1.02		
France	4	14				1.02		
Luxemburg	4	14				1.02		
Joists (beams):								
Belgium	4	13				1.01		
France	4	13				1.01		
Luxemburg	4	13				1.01		
Angles:								
Belgium	4	13				1.02		
⅛-in. plates:								
Belgium (a)	6	5	to	6	6	1.36	to	1.37
Germany (a)	6	5	to	6	6	1.36	to	1.37
¼-in. ship plates:								
Belgium	6	0	to	6	1	1.30	to	1.31
Luxemburg	6	0	to	6	1	1.30	to	1.31
Sheets, heavy:								
Belgium	6	1				1.31		
Germany	6	1				1.31		

(a) Nominal.

the steel orders for any ships of importance were placed.

The prospects for new shipbuilding during the second half of the year are described as only tolerably good. At the end of June 316 vessels were on the stocks, of 1,390,000 tons, the largest figures attained since September, 1924. Of these fully one-third represent vessels the construction of which was begun during the March quarter, and upon which there is, of course, a lot of work yet to be done.

LUXEMBURG MARKET WEAK

Iron and Steel Industry Loses Ground After Temporary Activity

LUXEMBURG, Aug. 1.—The rise of prices noted at the end of May persisted into June; but some weakness followed, lasting until the beginning of July, when prices improved again and orders increased. For the last fortnight the market has somewhat weakened.

Some Chinese markets, like Hankow, are still under the influence of civil troubles. But the situation seems improved at Shanghai and at Hong-Kong, where business has revived to some extent. On the other hand, although the Japanese financial crisis has developed favorably, some decrease in demand from Japan is noted. Some orders have come from British India, but at insufficient prices.

Many foreign engineers and technicians have met at Luxemburg for the recent "Journées Sidérurgiques," organized by the Luxemburg Association of Engineers. These meetings have been presided over by Mr. Kipgen, general manager of the A. R. B. E. D. The program has included important scientific papers and visits to several ironworks of the Grand Duchy. The visitors were much impressed by the progress realized in the rationalization of Luxemburg industry.

The Belgian Société d'Athus-Grivegnée, which owns the Steinfort works in the Grand Duchy, has merged with the Société des Acieries d'Angleur et Charbonnages Belges.

At the end of July the situation is much confused, under the lead of semi-finished steels, which are now on the down-grade, after having been recently on the up-grade. Some works are able, from sufficiently filled order books, to hold prices firm.

As regards phosphoric foundry pig irons, the Franco-Belgo-Luxemburg entente has been reconstituted—provisionally at least—upon the basis of new contingents for the part of the output that goes into Belgian consumption and for that which is exported. As has been seen in our correspondence from Paris, the prices have been somewhat reduced. Stocks at the ironworks in the Grand Duchy are insignificant.

In basic blooms transactions are particularly scarce at £3 18s. 6d. to £4 2s. 6d. ($19.04 to $20), according to sizes; likewise for billets at £4 3s. to £4 5s. 6d. ($20.13 to $20.73); largets at £4 7s. to £4 7s. 6d. ($21.10 to $21.22); all f.o.b. Antwerp.

Beams are weak at £4 10s. to £4 13s. (1 to 1.04c. a lb.); as are also rods at £5 2s. to £5 5s. (1.11 to 1.15c.). Bars are making a better stand at £4 12s. to £4 13s. (1.03 to 1.04c.). Delivery dates vary from one to three months after placing of orders.

Contrary to what was expected, the International Wire Rod Syndicate has not officially begun to work. But the export price is fixed at £5 10s. ($26.68) for exporters and £5 12s. 6d. ($27.28) for consumers.

The sheet market is unsteady. In heavy sheets, some French firms have accepted, it is said, £5 18s. 6d. to £5 19s. 6d. (1.30 to 1.32c.); while Belgians and Luxemburgians were holding for £6 to £6 1s. (1.33 to 1.34c.); medium and fine sheets are weaker still.

Export transactions with Germany are pretty active, and that country is a purchaser of semi-finished products, beams and small rails. America especially purchases beams and round bars for concrete.

Production of pig iron in the Grand Duchy of Luxemburg in June was 223,808 tons; of steel, 203,203 tons. Active on June 30 were 41 blast furnaces out of the 47.

GERMAN INDUSTRY ACTIVE

New Development in Aluminum Sheets, Manganese Ore and Strip Sheets

HAMBURG, GERMANY, July 31.—The Aluminum Research Institute in Germany has just completed investigations toward the replacement of tin sheets for the canning industry by aluminum sheets made according to the patents of a Mr. Serger. It has been found that the use of these aluminum sheets is not affecting the contents of the boxes, nor is the aluminum affected by the contents. The trials have lasted over a year. Various makers are to buy the patents, to replace tin boxes by aluminum boxes, which are not dearer in use. This will mean great reduction of tin and tin plate imports.

Iron ore exports from Sweden made a new record in June, as they never before the war reached 1,017,000 tons, as during June. In June, 1926, exports were 687,000 tons only. During the first half of 1927 the total was 4,350,000 tons, against 3,160,000 in January to June, 1926. It is expected that exports of ore will rise still further during the remainder of this year. The Grängesberg Co. has signed a contract with the Norwegian Government by which the latter will provide shipping facilities for at least 6,500,000 tons a year from Narvik.

Finished Steel Output Above Last Year

Production of German finished steel products in June amounted to 1,062,529 tons, against 1,089,779 tons in May and 852,904 tons in June, 1926. Output of wire rods was 83,100 tons only, against an average of 104,000 tons during the last few months. The production of joists was 118,326 tons and of bars 279,857 tons. The production of wire rods is less than last year (88,600 tons in June) and is explained by production restrictions, so that Germany might not have to pay the rate for overproduction fixed by the international association (the allotment is 1,000,000 tons a year for Germany).

The Gewerkschaft Battenberg has just started various mines on manganese ore in the Lahn district, where large and rich ore fields have been traced. Germany is extremely poor in manganese ore and it is hoped that these mines will be able to cover a large part of the demand needed by the industry, but imported so far from Russia, Brazil and India.

A special sub-association of the Hoop Iron Association, for the export of hot rolled hoops, has been founded, of which the Steel Union, the Stahlwerke Hoesch and the Kloeckner works are the chief members. This export association will especially develop business with the South and Central American republics and will work this market by its own representatives.

As in the United States, the demand for steel strips (strip sheets) is growing constantly and the production of strips has been taken up now by almost all works of importance. The hollow ware manufacturers are the chief buyers of steel strips in rolls, and have already placed important contracts.

The European tube market is in greater confusion than ever. A big new German tube works has been founded at Düsseldorf (Niederrheinische Stahlwerke, A. G.) which will not enter the syndicate. The market is further upset by proof that the French mills are selling at cheaper export prices than was mutually agreed. The Hungarian mills declined to enter the syndicate but the Polish are negotiating at Berlin, to make an end to the disastrous price fight in Scandinavian and Balkan countries. The German association states that the fight with the British mills will be ended soon by granting the British makers a certain minimum sale quantity and stopping the price fight. But outsiders in all countries are getting stronger and are making severe competition. Therefore a collapse of the international syndicate is not improbable and keen competition on all markets may most likely follow.

Exports of passenger automobiles from the United States during the first six months of the year showed a gain of 26 per cent over 1926. There was a 57 per cent gain in truck exports.

New British Steel Foundry Has Interesting Features

A recent interesting addition to the productive capacity of Sheffield is a new steel foundry, the work of Cammell, Laird & Co., at their Grimthorpe works, which is specially devoted to the manufacture of small castings. Primarily it was intended to deal with castings weighing from 10 lb. to 1½ tons but, since the start of the scheme, developments have taken place which will enable the foundry to deal with work up to 5 tons in weight. The plant is designed to produce 200 tons of castings a week, the old foundry being now reserved for heavier castings.

In the new establishment several interesting features have been adopted which have the effect of not only reducing manual labor, but of lightening the work and making it more pleasant. The arrangement of the sand-mixing plant is striking. The sand bunker has an oblong box neck protruding over the top of the mixing basin. As the box holds exactly 1 cwt. of sand, and has sliding panels at its top and bottom, it is a simple matter to "cut off" as many hundredweights as are required for a particular mix. The oil and water are measured in a glass gage, a spinner mixes them, and the oil mixture is then run into the basin, where it is churned up with the sand by revolving arms. The actual amount of manual labor involved in the operation does not occupy more than a few minutes, and there is no mess and no wasting of either oil or sand.

In the casting process, after the crane has conveyed the mold to the required position in the casting bay, the whole box is dropped on a knock-out grid running the full length of the bay, and under this moves a continuous conveyor to carry away the sand, etc., and sift and cleanse it for re-use. The stripping work is done by a two-ton crane which moves over the grid. Giant arms at the sides pick up the boxes, drop them, turn them over, and drop them again should the first blow have not loosened the contents. A ramming rod completes the clearance, and then a magnet draws the casting from the debris and deposits it on a truck for removal when the load is completed. The arms of the crane finish the task by piling the boxes in tidy heaps for wholesale distribution. The whole operation is under the control of one man, who can deal very quickly with the finished castings.

American Papers at the International Testing Congress

At the coming session of the International Congress for Testing Materials, to be held at Amsterdam, Holland, Sept. 12 to 17, eighteen papers by members of the American Society for Testing Materials will be presented. These were solicited by a special committee of the society. Those relating to metals are announced as follows:

General

"Materials Testing as a Stimulus to Research," by T. D. Lynch, manager materials and process engineering department, Westinghouse Electric & Mfg. Co., Pittsburgh.

Metals

"A Résumé of the Development and Application of High-Power Metallography and the Ultra-Violet Microscope," by F. F. Lucas, metallurgist, Bell Telephone Laboratories, Inc., New York.

"The Fatigue of Metals—A Study of Changing Concepts of Stress, Strain and Strength," by H. F. Moore, research professor of engineering materials University of Illinois, Urbana, Ill.

"Fatigue and Corrosion-Fatigue of Metals," by D. J. McAdam, Jr., metallurgist United States Engineering Experiment Station.

"Properties of Ferrous Metals at Elevated Temperatures as Determined by Short-Time Tensile and Expansion Tests," by A. E. White, professor of metallurgical engineering University of Michigan, Ann Arbor, Mich.

"Corrosion-Resistant Ferrous Alloys," by J. A. Mathews, vice-president and metallurgist Crucible Steel Company of America.

"Use and Development of Magnetic Analysis in the United States," by A. V. de Forest, research engineer American Chain Co., Bridgeport, Conn.

"Durability Tests of Nickel-Chromium Resistor Materials," by F. E. Bash, manager technical department, electrical alloy division, Driver-Harris Co., Harrison, N. J., and J. W. Harsch, research engineer Leeds & Northrup Co., Philadelphia.

Ten other papers deal with cement, concrete, stone, brick, and miscellaneous subjects.

It is announced that the following members of the society have indicated their intention of being present at the congress: D. A. Abrams, E. C. Bain, E. C. Bingham, V. L. Chechot, W. A. Cowan, W. H. Fulweiler, M. A. Grossman, H. C. Loudenbeck, F. F. Lucas, T. D. Lynch, P. H. Walker and A. E. White.

Official Delegates Appointed

Official delegates have been appointed by the executive committee as follows: Vice-president T. D. Lynch, Westinghouse Electric & Mfg. Co., and Past-President W. H. Fulweiler. These delegates will represent the society at the plenary session at which will be discussed the time and the place of the next congress and the field in which international cooperation can be established in the future. There is a possibility that the discussions may include the question of reorganizing the International Association for Testing Materials.

French Exports of Iron and Steel to This Country Decline

Exports of iron and steel products from France in June, compared with May and with the first half year of 1927 and 1926, are shown in the table, which covers merely pig iron, semi-finished steel (including beams and bars), steel rails and castings, including cast iron pipe. There was a substantial drop in shipments of both pig iron and semi-finished steel, with a heavy gain in rails and some gain in castings. In the first half year all items showed a heavy increase, ranging from one-third in pig iron and castings to nearly one-half in rails and other steel.

Noteworthy is the fact that no pig iron was sent to the United States in either May or June, and only 183 tons in the entire half year. Semi-finished steel sent to the United States dropped off one-third from the first half of last year. Steel rails exported to the United States dropped more than 70 per cent from last year. Castings, which probably means principally cast iron pipe, showed a slight reduction from last year so far as the United States is concerned.

FRENCH IRON AND STEEL EXPORTS

Metric Tons	June, 1927	May, 1927	First Half Year 1927	First Half Year 1926
Pig iron	65,119	85,848	448,777	334,057
United States	.....	.....	*183*	*18,959*
Semi-finished steel, beams, bars, etc.	200,033	226,782	1,459,260	1,041,934
United States	*2,421*	*1,263*	*14,208*	*21,428*
Rails	41,183	31,752	197,179	132,508
Germany	*6,578*	*2,962*	*20,870*	*15,095*
Japan	*6,570*	*2,507*	*18,742*	*9,745*
Morocco	*3,789*	*1,353*	*8,829*	*5,983*
Italy	*3,241*	*928*	*13,175*	*16,640*
Switzerland	*2,843*	*2,887*	*14,512*	*13,584*
Great Britain	*1,866*	*2,423*	*19,111*	*9,985*
Netherlands	*1,216*	*1,018*	*5,753*	.....
Portugal	*895*	*905*	*8,424*	.....
Belgium-Luxemburg	*626*	*1,349*	*9,643*	*11,514*
United States	.....	*170*	*637*	*2,389*
Algeria	*551*	*1,377*	*6,549*	*3,131*
Spain	*96*	.....	*964*	.....
Brazil	.....	.....	*3,940*	*7,035*
Argentina	.....	.....	*2,391*	.....
Castings	33,947	30,495	178,460	131,046
United States	*4,642*	*1,815*	*20,244*	*22,196*

Employment in July was better than in June, according to the monthly Labor Barometer of the National Metal Trades Association. The gain was about 1 per cent in number. Both figures, however, were much below those for the spring months and still further below the corresponding figures for last year. The July totals were given as 573,860 this year and 628,198 last year. The June figures were 568,283 this year against 612,108 a year ago. An increase in average earnings is recorded, from $27.39 a week in April to $27.52 in May.

Another Gain in Steel Corporation's Unfilled Orders for July

For July, the second month in succession, the unfilled orders of the United States Steel Corporation increased. At 3,142,014 tons on July 31, the increase in the month was 88,768 tons. The increase in June over May was 2305 tons. Previous to June there had been five successive months of decreases.

The following table gives the unfilled tonnage by months, commencing with January, 1925:

	1927	1926	1925
Jan. 31	3,800,177	4,882,739	5,037,323
Feb. 28	3,597,119	4,616,822	5,284,771
Mar. 31	3,553,140	4,379,935	4,863,564
April 30	3,456,132	3,867,976	4,446,568
May 31	3,050,941	3,649,250	4,049,800
June 30	3,053,246	3,478,642	3,710,458
July 31	3,142,014	3,602,522	3,539,467
Aug. 31	.....	3,542,335	3,512,803
Sept. 30	.....	3,593,509	3,717,297
Oct. 31	.....	3,683,661	4,109,183
Nov. 30	.....	3,807,447	4,581,780
Dec. 31	.....	3,960,969	5,033,364

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

Output of Motor Vehicles and Parts in 1925

Products to the value of $4,721,402,556 were turned out in 1925 by 1655 establishments engaged in the production of motor vehicles and bodies and parts for them, according to the Bureau of the Census. Of the 3,565,945 passenger cars produced, nearly one-half were valued at $500 or less wholesale. Of the 498,363 business vehicles, including motor buses, delivery wagons and trucks, almost three-quarters were of 1-ton capacity, or less. Figures for the ratings are shown in the table:

Passenger Vehicles	
Valued up to $500	1,458,395
$501 to $800	1,163,061
801 to 1,500	776,148
1,501 to 2,500	136,811
2,501 to 3,500	17,526
3,501 and over	14,004
Total	3,565,945
Business Vehicles	
Up to 1 ton inclusive	363,483
Over 1 ton to 2½ tons	107,582
3 to 4½ tons inclusive	15,178
5 tons	9,334
Over 5 tons	2,787
Total	498,364

Details of many particulars, including data by States, are shown in the report, which may be obtained at 5c. from the Superintendent of Documents, Government Printing Office, Washington.

Cast-Steel Stud-Link Chain Produced in Scotland

At the Parkhead Forge of William Beardmore & Co., Ltd., Glasgow, Scotland, there has just been produced a finished cast steel chain, 12½ fathoms in length, of the 3-in. stud-link type, with the necessary shackle. The work is of special interest because of the many attempts which have been made in the past to manufacture steel chains by casting. They were made in the United States during the war.

The new chain has passed through the most severe official tests, a 3-link section carrying a load of 400 tons without any sign of fracture and with a total elongation of only 6¾ in. A load of 204 tons, as stipulated by the British Admiralty, was put on the whole length of the chain, when there were no fractures, and the elongation on a length of 73 ft. was only 15½ in. The chain is now in regular service.

Daily movement of freight cars in the first six months of 1927 averaged 29.9 miles, according to the Bureau of Railway Economics. This is the highest for any corresponding period on record, having been 0.9 mile above last year and 0.3 mile above 1925.

French Iron and Steel Output Less in June, Higher in Half Year

PARIS, FRANCE, Aug. 1.—French production of pig iron in June was 746,644 metric tons, compared with 794,175 tons in May. For the first half year the total was 4,636,992 tons, a gain of 1½ per cent over the 1926 figure of 4,570,092 tons.

Raw steel produced in June amounted to 671,907 metric tons, compared with 711,874 tons in May. For the half year there was a slight gain, from 4,060,715 tons to 4,069,652 tons.

Furnaces in blast numbered 143 on June 30, against 146 a month earlier and 153 a year earlier. On June 30, 1927, there were 36 out of blast and 39 under construction or repair. The total was 218, compared with 217 a year ago.

FRENCH IRON AND STEEL OUTPUT

Pig Iron

Metric Tons	June, 1927	May, 1927	First Half Year 1927	First Half Year 1926
Basic iron	566,981	621,237	3,521,945	3,394,393
Foundry iron	134,119	119,593	825,204	880,273
Forge iron	22,812	25,048	159,032	174,921
Special iron	19,958	25,776	115,440	110,304
Bessemer iron	2,774	2,521	15,371	10,201
	746,644	794,175	4,636,992	4,570,092

Raw Steel

Ingots	659,946	700,241	3,397,745	3,366,943
Castings, direct	11,961	11,633	671,907	693,772
	671,907	711,874	4,069,652	4,060,715
Including:				
Basic steel	466,957	503,035	2,879,238	2,797,066
Open-hearth steel	190,222	193,767	1,103,735	1,187,839
Electric steel	7,964	8,282	45,810	39,451
Acid steel	6,018	5,951	34,755	29,904
Crucible steel	746	839	6,114	6,455
	671,907	711,874	4,069,652	4,060,715

British Iron and Steel Output in July

LONDON, ENGLAND, Aug. 15 (*By Cable*).—Pig iron production in July was 645,800 gross tons and that of steel ingots was 682,900 tons. This compares with 650,500 tons of pig iron and with 747,300 tons of steel in June.

The comparison of this year's output with the monthly production in recent years is shown by the following table in gross tons:

	Pig Iron, Tons	Steel Ingots and Castings, Tons
1913—Average monthly	855,000	638,600
1920—Average monthly	669,500	755,600
1922—Average monthly	408,500	490,100
1923—Average monthly	620,000	706,800
1924—Average monthly	609,900	685,100
1925—Average monthly	519,700	616,400
1926—Average monthly	203,500	296,700
1927—First quarter, per mo.	559,100	835,700
1927—Second quarter, per mo.	683,500	826,600
1927—July	645,800	682,900

Ore Imports Greater Than Last Year

Imports of iron ore into the United States in the 12 months ended June 30 are reported by the Department of Commerce at 2,636,933 gross tons, against 2,377,760 tons last year. The figure for June was 231,815 tons, which is 15 per cent under that of June last year. In both years Chile furnished more than half the total supplied, while Cuba and French Africa occupied second and third positions. Details are shown in the table.

SOURCES OF AMERICAN IMPORTS OF IRON ORE

(In Gross Tons)

	June 1927	June 1926	12 Months Ended June 1927	12 Months Ended June 1926
Chile	132,900	110,350	1,345,300	1,307,700
Cuba	22,000	33,500	503,500	507,112
Spain	.....	27,250	17,312	118,112
Sweden	22,776	7,870	134,812	120,665
French Africa	44,241	89,729	371,570	232,281
Canada	.....	885	16,346	17,346
Other countries	9,898	2,865	248,093	74,544
Total	231,815	272,449	2,636,933	2,377,760

Machinery Markets and News of the Works

GENERAL BUYING SLOW

Railroads Slightly More Active in Chicago Market

Orders for 38 Milling Machines from a European Manufacturer and One for 10 Shapers from Detroit Motor Company

BUYING of machine tools continues at a slow midsummer pace. There has been slightly more activity at Chicago, with some orders from railroads, but generally the situation shows little, if any, improvement as compared with last month, which was the dullest of the year. An American machine tool company has booked an order for 38 milling machines to be shipped to a European automobile manufacturer, and a Detroit motor company has bought 10 shapers.

The Chicago, St. Paul, Minneapolis & Omaha Railroad has added to its recent purchases, now having completed the ordering of practically all of the tools on its list. The Rock Island is expected to buy the remainder of its tool requirements soon, while action is also looked for on the Burlington inquiry for a half dozen items. The Chicago, Milwaukee & St. Paul is inquiring for a 4-ft. radial drill, a 20-in. shaper and some other tools for its rail reclamation shop at Tomah, Wis.

Not only is the summer vacation period working to hold up scheduled purchases, but manufacturers seem to be awaiting the opportunity to make a full appraisal of fall business prospects before committing themselves to the addition of new equipment or the replacing of old machines. There are many outstanding quotations, on which action in a majority of cases will probably be deferred until next month.

New York

NEW YORK, Aug. 16.

MACHINE tool business continues very slow. Local sales offices have a good many outstanding quotations, but find it difficult to obtain orders from prospective purchasers. There is a general tendency to await the opportunity for a full appraisal of fall business prospects before adding to present equipment or replacing old tools. A European automobile manufacturer bought 38 milling machines from an American company. Among the week's purchases were: A special cutter-grinder for a manufacturing plant at Hamilton, Ohio; a 14-in. vertical surface grinder for a Milwaukee company; a deep-hole drilling machine for a tractor maker in the Middle West; a 12-in. vertical shaper and an 8-in. rotary grinder for a valve manufacturer in Massachusetts; a 7-in. x 32-in. bench lathe for an electrical manufacturer at Erie, Pa.; a jig boring machine for a Detroit automobile manufacturer; a single-spindle bench drill for a Chicago manufacturer; a profiler for a Chicago company; a No. 4, 52-in. carwheel lathe for the Erie Railroad; a 60-in. x 20-ft. heavy type planer for a forging company in Pennsylvania; a 36-in. to 40-in. side head boring mill for a Milwaukee concern, and a 90-in. wheel turning lathe for the New York Central Railroad.

The Orange Roller Bearing Co., Orange, N. J., has been organized to succeed the Orange Bearing Sales & Service Co., and will manufacture principally taper roller bearings of a new design. Some additions to the old plant have already been made and the company plans further extensions in the near future. High carbon, high chrome steel is used in considerable quantity in the manufacture of this bearing and the company is in the market for this and other alloy steels.

The Turner Construction Co., New York, has received the contract for a warehouse at Hunters Point Avenue and Haywood Street, Long Island City, N. Y., for Bloomingdale Brothers, Inc., New York. The building will be of reinforced concrete construction, approximately 200 x 390 ft., with seven stories and basement.

Jamestown Metalsmiths, Inc., Jamestown, N. Y., has been organized and has purchased the plant of the Die Cast Art Bronze Corporation to manufacture cast metal specialties of various sorts. The company is not in the market for new materials and equipment.

The Intertype Corporation, foot of Montague Street, Brooklyn, manufacturer of typesetting machines and parts, has concluded arrangements for the purchase of 43 acres extending from West to Calvert Streets, Harrison, N. Y., as a site for a new plant, at a reported cost in excess of $350,000 with equipment.

A machine and repair shop, with automobile service and garage division, will be installed in the three-story postal station to be erected by the New York Postal Service Station, Inc., 165 Broadway, New York, Anthony F. Koelble, president, on Thirty-third and Thirty-fourth Streets, between Tenth and Eleventh Avenues, to cost about $500,000, for which a general contract has been let to the B. L. T. Corporation, 152 West Forty-second Street. Henry A. Koelble, Bible House, is architect.

Edwin C. Goergi, 24 Adrian Avenue, New York, architect, is completing plans for a two-story automobile service, repair and garage building at 26 Sherman Avenue, estimated to cost $100,000 with equipment.

Grathwohl & Meissner, Inc., 548 West Fifty-fourth Street, New York, operating a machine shop and automobile repair works, has leased property at 352 West Fifty-third Street, and will establish a new plant at that location.

The Spencer-Wynne Paper Products, Inc., Newburgh, N. Y., lately formed with a capital of $750,000, has plans under way for a one-story mill at Dickson and Renwick Streets and Robinson Avenue, to cost in excess of $100,000 with machinery. John B. Corwin, Savings Bank Building, Newburgh, attorney, represents the company, of which Roy W. Spencer, 85 Grand Street, is president. Prentiss D. Wynne, 213 Ashby Road, Upper Darby, Pa., will be an official of the new concern.

Albert Lewis, Lewis Development Co., 47 West Thirty-fourth Street, New York, is at the head of a project to construct and operate an airport in the Borough of Queens, where purchase of a tract of 100 acres of land in the Flushing meadow district, between Flushing and Corona, L. I., is being consummated. Plans will be drawn at once for a group of hangars, machine and repair shops and service buildings, as well as radio station, runways, etc. The development, it is reported, will cost $600,000.

The Superintendent of Standards and Purchase, Executive Department, Albany, N. Y., is asking bids until Sept. 1 for a proposed power house at the State Hospital for Treatment of Tuberculosis, Raybrook, N. Y. Plans and specifications at the office of Sullivan W. Jones, Capitol Building, Albany, State architect.

The Cino Motor Repair Co., 10 East Second Street, New York, has acquired an adjoining five-story building at 8 East Second Street, 25 x 64 ft., and will use for expansion.

M. Bartos, 535 East Seventy-ninth Street, New York,

manufacturer of furniture, will take bids before the close of the month for a new one-story factory at Freeman Avenue and Ely Street, Long Island City, to cost approximately $80,000 with machinery. Ward, Kerrigan & Manguson, 420 Lexington Avenue, are architects.

The Uppercu-Cadillac Corporation, 1881 Broadway, New York, has broken ground for a new 13-story and basement service, repair and distributing plant for Cadillac automobiles on the block front, Columbus Avenue, Sixty-second to Sixty-third Streets. All mechanical departments will be concentrated in the new building, which will total 350,000 sq. ft. of floor space, including machine and repair shops, parts and accessory departments, service division, coach department and other branches. Inglis M. Uppercu is president.

The Surface Combustion Co., 366 Gerard Avenue, New York, manufacturer of power equipment, etc., has concluded arrangements for the purchase of the former Towar textile mills, Toledo, Ohio, and will remodel and equip for a new plant, with construction of new unit to cost approximately $250,000 with equipment. The works will be given over primarily to the manufacture of ovens, gas burners and kindred apparatus. Frank Adams is president.

The Board of Education, Yonkers, N. Y., is having plans prepared for a new addition to its Saunders trade school, South Broadway, reported to cost in excess of $75,000. New equipment will be installed. G. H. Chamberlain, 18 South Broadway, is architect.

The Asher Mfg. Co., 212 Coit Street, Irvington, N. J., manufacturer of laundry machinery, has taken out a permit for a proposed one-story addition, 60 x 175 ft., to cost about $35,000 with equipment, for which a general contract recently was let to Enstice Brothers, 111 Academy Street, Newark, N. J. Richard W. Erler, 33 Fulton Street, Newark, is architect.

Officials of the Foster-Wheeler Corporation, New York, recently formed to consolidate the Wheeler Condenser & Engineering Co. and the Power Specialty Co., have organized a new company with capital of 100 shares of stock, no par value, to take over and operate the plant at Carteret. John and Harry S. Brown and Louis B. Nutting head the new organization, which has taken the name of the Wheeler Condenser & Engineering Co.

The General Lead Batteries Co., 4 Lister Avenue, Newark, manufacturer of storage batteries, etc., has awarded a general contract to Miller-Blyth, Inc., 441 Lexington Avenue, New York, for a one-story addition at 99-129 Chapel Street, to cost about $45,000. E. A. Margueson is vice-president.

The Colonial Art Metal Works, Inc., Newark, recently formed by Isaac Wildhorn, 331 Belmont Avenue, and associates, with capital of $100,000, has leased property at 30 Branford Place, corner Sherman Avenue, and will occupy at once for a new plant for the production of wrought iron products, metal novelties, etc. Samuel A. Denburg is treasurer.

Interests which recently acquired the ice-manufacturing plant of the Shelley Hygiene Ice Co., 106 Water Street, Morristown, N. J., headed by Benjamin Bernstein, Rahway, N. J., have concluded arrangements for the purchase of the similar local plant of the Leonard Hygiene Ice Co., 44 Abbott Avenue, and will take early possession; the acquisition comprises ice-manufacturing unit only. The new owner is considering plans for early extensions and betterments, including installation of additional equipment.

The Wright Aeronautical Corporation, Paterson, N. J., has exercised an option to purchase the plant property on Lewis Street, now occupied under lease, for a consideration of $400,000, from the Paterson Industrial Development Co. The Wright company purposes to carry out an expansion program at the site, and has filed plans for a one-story unit, to be used largely for testing service. J. Farrer, Smith Street, is architect.

A. E. Sleight, 134 Washington Street, Paterson, N. J., architect, has asked bids on general contract for a new two-story automobile service, repair and garage building at Ellison Street and Madison Avenue, reported to cost close to $200,000 with equipment.

The Public Service Corporation of New Jersey, Public Service Terminal, Newark, operating the Public Service Electric & Gas Co. and other utility properties, is arranging for a new preferred stock issue of $17,156,600, a portion of the fund to be used for expansion and betterments.

The Warren Foundry & Pipe Corporation, 11 Broadway, New York, formerly the Replogle Steel Co., reports net income for the first six months of 1927 of $217,790, after depreciation, depletion and Federal taxes. This compares with $314,951 in the corresponding period of 1926.

Philadelphia

PHILADELPHIA, Aug. 16.

THE Philadelphia Gear Works, maker of gears and speed reducing units, will occupy on Sept. 1 its large and modern new building at Erie Avenue and G Streets, Philadelphia. For the past several years this concern has been located at Richmond and Tioga Streets, and for many years prior to that was at 1120 Vine Street, Philadelphia. The new home of the Philadelphia Gear Works was necessitated by constant increase in business, and is the outcome of nearly a half century spent in making gears and allied products. The new offices and plant are on the main line of the Pennsylvania Railroad to New York.

The Earle Gear & Machine Co., with main office and plant at 4707 Stenton Avenue, Philadelphia, announces the opening of a New York office at 95 Liberty Street. C. N. Walsh and George E. Barrett are in charge. The Earle Gear & Machine Co. also maintains a district office in charge of William H. Allen at 110 State Street, Boston.

Thomas Halton's Sons, Inc., Mascher Street, near Oxford Street, Philadelphia, manufacturer of textile machinery, is planning the construction of a new plant on site, 155 x 500 ft., at Clearfield and Rosehill Streets, reported to cost more than $50,000 with equipment. T. H. Halton is one of the heads of the company.

The General Electric Co., Witherspoon Building, Philadelphia, has filed plans for a one-story addition, 140 x 554 ft., on Elmwood Avenue, near Sixty-seventh Street, to cost about $400,000 with equipment. Harris & Richards, Drexel Building, are architects. Headquarters are at Schenectady, N. Y.

Frank E. Hahn, 629 Chestnut Street, Philadelphia, architect, has filed plans for a six-story automobile service, repair and garage building at 1709-15 Locust Street, estimated to cost $250,000 with equipment, for which general contract has been let to the Foundation Co., 123 Liberty Street, New York.

The Bear Engineering & Construction Co., 1712 Ludlow Street, Philadelphia, has acquired the building at 1518 Summer Street, and will remodel and improve for early occupancy, using for expansion.

The Department of City Transit, 1211 Chestnut Street, Philadelphia, is asking bids until Aug. 23, for furnishing and installing an underground cable system from the City Hall to the Fern Rock terminal yard, Broad Street subway, contract 156; H. E. Ehlers is director.

The Archdiocese of Philadelphia, Eighteenth and Summer Streets, is said to be planning the installation of vocational training departments in its proposed four-story and basement boys' high school at Tenth and Luzerne Streets, reported to cost more than $500,000. Hoffman-Henon, Finance Building, are architects.

The Roberts-Nash Motor Co., 1235 North Broad Street, Philadelphia, representative for the Nash automobile, has awarded a general contract to the J. S. Rogers Co., Drexel Building, for a five-story addition to its service, repair and sales building at Broad and Thompson Streets, estimated to cost $150,000 with equipment. Philip S. Tyre, 114 South Fifteenth Street, is architect.

The Eddystone Mfg. Co., Eddystone, Pa., is planning the construction of a new mechanical and chemical laboratory at its print and dye works, to cost in excess of $200,000 with equipment. The company is operated by the Joseph Bancroft & Sons Co., Wilmington, Del.

The United Gas Improvement Co., Broad and Arch Streets, Philadelphia, operating electric light and power, gas and other utility properties, has called a special meeting of stockholders on Sept. 15, to approve an increase in capital from 2,036,528 to 2,130,088 shares of stock, each of $50 par value, the proceeds to be used in part for expansion, including the acquisition of interest in the Hartford City Gas Light Co., Hartford, Conn., Connecticut Gas & Coke Securities Co., New Haven, Conn., and for the purchase of a controlling interest in Day & Zimmermann, Inc., Seventeenth and Chestnut Streets, Philadelphia, operating electric utilities in different parts of the country. G. W. Curran is secretary.

Samuel Yellin, 5520 Arch Street, Philadelphia, operating a sheet metal works, has awarded a general contract to Haverstick & Borthwick, Schaff Building, for a two-story and basement addition, 35 x 100 ft., at Allison and Arch Streets, estimated to cost $25,000 with equipment.

D. B. Flower, 1217 Spring Garden Street, Philadelphia, railroad equipment and supplies, has revised plans nearing completion for a new one-story factory at Washington Street and Van Sant Avenues, Morrisville, Pa., reported to cost close to $30,000 with equipment. Bids will soon be asked on general contract. Thomas B. Stockham, Stockham Building, Morrisville, is architect.

The Pennsylvania Railroad Co., C. E. Walsh, Room 415, 15 North Thirty-second Street, Philadelphia, purchasing agent, is asking bids until Aug. 23, for a quantity of conductor cable, contract 101.

The Crane Market

THE market for both overhead and locomotive cranes is seasonably dull, the only feature of the week having been the placing of a fairly large order by the General Electric Co. There are several inquiries outstanding on which action may be expected in the fall, but the volume of new work coming out is practically negligible. The New York Central has not yet placed the order for three locomotive cranes which it expects to purchase, and further purchases are yet to be made for the Hopewell, W. Va., plant of the Atmospheric Nitrogen Co.

Crane business in the Pittsburgh district is active enough so far as inquiries are concerned but sales are few. The Carnegie Steel Co. is expected to close soon for a 125-ton ladle crane and a 25-ton crane for its Homestead works and Jones & Laughlin Steel Corporation is mentioned as a prospective buyer of some cranes. The United Engineering & Foundry Co. is yet to place two 15-ton trolleys wanted for its Tod works, Youngstown. The Central Alloy Steel Corporation is in the market for two 10-ton, 77-ft. span cranes for its Berger division works, Canton, Ohio.

Among recent purchases are:

General Electric Co., Schenectady, N. Y., nine 5-ton electric overhead cranes, from the Northern Engineering Works

Gulf Refining Co., Pittsburgh, a 6-ton, double I-beam hand power overhead crane, 13 ft., 6 in. span, 47 ft. lift, for its Bayonne, N. J., plant, from the Armington Engineering Co.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, a 4-ton, 56-ft. overhead crane for its Covington, W. Va., mill, from the Shaw Crane Works.

Boston & Albany Railroad, a 20-ton electric overhead crane for its Boston freight yards, from the Milwaukee Electric Crane & Mfg. Corporation.

Carnegie Steel Co., two 2½-ton soaking pit cranes for Ohio works, Youngstown, from Alliance Machine Co.

American Sheet & Tin Plate Co., Wood works, McKeesport, Pa., one 15-ton, 52-ft. 6-in. span crane, from Cleveland Crane & Engineering Co.

Otis Steel Co., Cleveland, one 200-ton ladle crane, from Alliance Machine Co.

Kokomo Steel & Wire Co., Kokomo, Ind., several cranes and rolling mills, from Morgan Engineering Co.

American Mond Nickel Co., Clearfield, Pa., one 15-ton trolley from Harnischfeger Corporation.

The City Commission, Camden, N. J., in cooperation with the South Jersey Port Commission, is considering the construction of a new marine terminal on the Delaware River, vicinity of Spruce Street, to include a cold storage plant with elevating, conveying, loading and other mechanical equipment for freight handling. The project is reported to cost more than $500,000.

A large boiler and power house is planned by the Campbell Soup Co., Camden, N. J., in connection with proposed new plant units between Cooper and Linden Streets, fronting on the Delaware River; elevating, conveying and other mechanical-handling equipment will be installed in the factories which will be of multi-story type, reported to cost in excess of $2,000,000. Work is scheduled to begin early in 1928. A. C. Dorrance is general manager.

The Atlantic City Electric Co., Atlantic City, N. J., has secured permission to issue bonds for $1,500,000, 10,000 shares of preferred stock and 102,590 shares of common stock, a portion of the fund to be used for the acquisition of the Electric Co. of New Jersey and the Atlantic County Electric Co., operating in this district, and extensions and improvements in power plants and system, including transmission line construction.

The Reading Co., Reading Terminal, Philadelphia, has awarded a general contract to the Hughes-Foulkrod Co., 1505 Race Street, for a one-story engine house and machine and repair shop at Shamokin, Pa., reported to cost more than $75,000 with equipment. Otto Herald is architect.

The Philadelphia & Reading Coal & Iron Co., Pottsville, Pa., is developing its local foundry for commercial cast iron pipe production and will enter into competition in this line for furnishing such product for water service for municipalities and other interests.

The City Council, Allentown, Pa., is asking bids until Sept. 6 for centrifugal pumping machinery and auxiliary equipment for the municipal sewage system. Plans and specifications at the office of the Bureau of Sewage Disposal Plant and Sewers. Metcalf & Eddy, Statler Building, Boston, are engineers.

The C. M. Dodson Coal Co., Beaver Brook, Pa., is planning the installation of new hoisting equipment and other facilities for increased production at its local properties.

The Board of Education, Glassboro, N. J., plans the installation of manual training equipment in a proposed new high school at Delsea Drive and Focer Avenue, reported to cost about $475,000 with equipment. A special election has been called to approve the project.

Absorption of the Willey-Ellis Co., of Philadelphia, Chicago and Columbia, Pa., the Willey-Ellis Co. of California, San Francisco, and the Tolhurst Machine Works, Troy, N. Y., into the General Laundry Machinery Corporation, Fifty-third and Lansdowne Avenues, Philadelphia, is announced by the latter company. The absorbed companies will retain their factories and personnel and their old established names, but their operations will be controlled by the General Laundry Machinery Corporation.

The Crucible Steel Co. of America, New York, for the six months ended June 30, reports net profits of $2,974,536 after depreciation, interest and Federal taxes, equivalent after preferred dividends to $3.82 a share on the common stock. In the first six months of 1926 the company earned $3,113,682, or $4.07 a share.

New England

BOSTON, Aug. 16.

MACHINE tool sales the past week were somewhat larger than for the previous week, but the market is still a long way from active. It seems practically assured, however, that total sales for the first half of August were more numerous than for the last half of July, but it is doubtful if the money involved the first half of August was as great. Sales of new tools reported the past week included a surface grinder and a vertical shaper to a central Massachusetts shop; two cup wheel grinders to a Fitchburg, Mass., shop; a 4-ft. radial drill to a north of Boston plant. It is reported that a Maine cement plant has bought two tool room lathes, a radial drill, a bolt cutter, a shaper and miscellaneous machine shop equipment. Used tools sold were a No. 25 Becker milling machine to a Brockton, Mass., shop; a two spindle drill press; a 42-in boring mill, and a 28-in. x 10-ft. lathe, all to Massachusetts plants, and about a dozen small inexpensive tools. Inquiries are few and far between. The Boston & Maine Railroad is in the market for a special grinding machine and there is some inquiry from manufacturing plants for single radial drills, lathes, shapers and miscellaneous equipment.

Joseph Beal & Co., 465 Atlantic Avenue, Boston, have leased 7,000 sq. ft. of floor space at Summer and Second Streets, South Boston. The new quarters will be devoted largely to a display of heavy mechanical equipment. The company's present quarters will be retained for the sale of light machine tools.

McBerney & Senior, Howard Street, Newburyport, Mass., silverware, have started a one-story, 30 x 45-ft. manufacturing plant at Merrimac and Ashland Streets.

Herbert S. Clivedon, 46 Cornhill Street, Boston, engineer, is revising plans for a one- and two-story, 100 x 227-ft. manufacturing plant for the Meisel Press Mfg. Co., Dorchester Avenue and Crescent Street, Dorchester district.

Plans have been completed for two cable mill additions, each 80 x 100 ft., and a one-story, 80 x 175-ft. rod mill to be erected by the American Electric Works, Phillipsdale, R. I.

The American Bosch Magneto Corporation, Springfield, Mass., has closed a contract with the Ford Motor Co. to furnish a substantial part of the ignition systems to be used in the new Ford cars. The company is making plans for additional machinery and equipment in its main plant to care for the new business.

The New Home Sewing Machine Co., Orange, Mass., is to reorganize and refinance its business with a view to adding new equipment for more economical production. Fred Bender, vice-president and general manager, Metropolitan Sewing Machine Corporation, Nyack, N. Y., has been made president of the Massachusetts company.

The International Wire Products Co., which purchased the assets and business of the Home Accessories Co., Worcester, Mass., and the C. E. Prentice Mfg. Co., New Britain, Conn., wire-forming machinery and dies, has also purchased the plant of the Natick Shoe Co., Natick, Mass., and will manufacture there a diversified line of nickel plated and enameled bathroom and kitchen fixtures.

The Keyes Fibre Co., Waterville, Me., recently formed, will take over and expand the company of the same name, with local mill, and the property of the Rex Pulp Products Co., Bath, Me. The two interests will be consolidated. The last noted company was lately organized to acquire the plant of the Bath Iron Works, Bath, and is now converting that property for the manufacture of molded and pressed wood-pulp specialties. The Waterville mill will be continued as in the past for the manufacture of pie plates and similar products made under a molded pulp process. The new organization will carry out an expansion program and has arranged for a stock issue to total $1,890,000. Walter S. Wyman, president of the Central Maine Power Co., Augusta, will act in like capacity for the Keyes company.

The Sewerage Department, Nahant, Mass., has plans for the installation of a new pumping plant for municipal service. Weston & Sampson, 14 Beacon Street, Boston, are engineers.

The Strathmore Paper Co., Mittineague, Mass., will make extensions and betterments in its main mill at Woronoco, Mass., including traveling crane installation the entire length of machine department, improvements and replacements in paper-making machines and enlargements in other facilities for increased production. The plant has been closed down temporarily to provide for the program.

A citizen's committee at Wallingford, Conn., Dr. James D. McGaughey, chairman, has approved plans for the establishment of a municipal airport at the South Plains field, where a tract of land will be acquired at once. Hangar, machine repair and reconditioning shop, oil house and other buildings are proposed.

The James E. Graves Co., Marblehead, Mass., is considering the rebuilding of its boat-building and repair yards partially destroyed by fire, Aug. 2, with loss reported at $35,000, including equipment.

The General Burners Corporation, Worcester, Mass., recently formed by Alfred P. Lachance, 14 Randolph Road, and associates, has concluded negotiations for the acquisition of the local plant of J. E. Snyder & Son, manufacturers of upright drills and other tools, the purchase including plant equipment and business. The new owner will continue operations for machine tool production, and proposes to remodel and improve a portion of the factory for the manufacture of oil burners and oil-burning equipment. Mr. Lachance will be treasurer of the company, of which Joseph T. Lord has been elected president.

In connection with the new addition to the plant of the Rumford Chemical Co., Rumford, R. I., consisting of a five-story unit, 100 x 220 ft., and one-story structure adjoining, the company proposes to remove its present factory on South Main Street, Providence, to the Rumford works, where production will be concentrated in the future. The expansion will cost $300,000; additional equipment will be provided for increase in present output. The new structures are scheduled for completion by the close of the year, when the change will be carried out. J. W. Tingley is chief engineer, in charge.

Buffalo

BUFFALO, Aug. 16.

THE Worthington Pump & Machinery Corporation, Clinton and Roberts Streets, Buffalo, is reported to be considering the erection of a new addition to its local plant, one-story, to cost in excess of $50,000, with equipment. Headquarters are at 115 Broadway, New York.

The Republic Motor Truck Co., Alma, Mich., has concluded arrangements for the purchase of the plant and business of the Linn Mfg. Corporation, Morris, N. Y., manufacturer of special type tractors for heavy duty, and will consolidate with its organization. It is purposed to maintain operations at the Morris plant, as heretofore, with the Linn company as a division of the parent organization; expansion is under consideration. O. W. Hayes is president of the purchasing company.

The Board of Public Works, Corning, N. Y., is asking bids until Aug. 22, for a pumping plant in Denison Park for the municipal waterworks. H. Burdett Cleveland, 225 Broadway, New York, is consulting engineer. William O. Drake is superintendent.

The Board of Education, Dunkirk, N. Y., is planning to ask bids on general contract early in September, for extensions and improvements in the two-story vocational school, estimated to cost close to $50,000. O. R. Johnson, Tenson Building, Jamestown, N. Y., is architect.

The Niagara Machine & Tool Works, 637-83 Northland Avenue, Buffalo, has taken out a permit for a proposed one-story machine shop addition to cost approximately $90,000, with equipment, and will proceed with superstructure at once. H. E. Plumer and Associates, 775 Main Street, are architects.

The Eastman Kodak Co., 343 State Street, Rochester, N. Y., has awarded a general contract to the Ridge Construction Co., 335 Lewiston Avenue, for a new plant addition on St. Paul Avenue, to cost approximately $120,000, with equipment.

The new company being formed by interests connected with F. L. Carlisle & Co., Watertown, N. Y., operating public utility properties, to operate an insulating and wallboard mill at Oswego, N. Y., will be known as the Oswego Board Corporation, capitalized at 50,000 shares of stock, no par value. Plans are said to be under way for the initial mill unit at Oswego, with estimated cost of entire project placed at $650,000. Headquarters of the Carlisle organization are at 49 Wall Street, New York.

The Central Union High School District, Brockport, N. Y., plans the installation of manual training equipment in a proposed local two-story high school, estimated to cost $400,000. P. A. Blossom is chairman of the Board of Education.

Pittsburgh

PITTSBURGH, Aug. 15.

MACHINE tool business is running chiefly to parts and small machines and while such sales are fairly numerous, the monetary value is low. Few inquiries are developing except by solicitation.

The old Point bridge, Pittsburgh, recently replaced by a new steel structure, has been sold for scrap to the United Iron & Metal Co., Pittsburgh. There are about 1320 tons of wrought iron and 523 tons of steel in this bridge, which marked the first step away from wooden bridges in Pittsburgh.

Contract has been let by the Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York, to the Hughes-Foulkrod Co., 421 Seventh Avenue, Pittsburgh, for three one-story additions to its plant at Franklin, Pa., 100 x 295 ft., 130 x 220 ft., and 60 x 230 ft., for machine shop, foundry and power plant, estimated to cost close to $500,000 with equipment. Ernest McGeorge, 3030 Euclid Avenue, Cleveland, is consulting engineer.

The Bradford Electric Co., Main Street, Bradford, Pa., will soon take bids on revised plans for a two-story equipment storage and distributing plant, with repair facilities and office, on Chestnut Street, reported to cost close to $75,000. L. O. Langworthy is in charge.

The National Fireproofing Co., Fulton Building, Pittsburgh, manufacturer of hollow tile, conduits and other structural fireproofing products, has called a special meeting of stockholders on Sept. 1, to approve a bond issue of $3,000,000, a portion of the proceeds to be used for expansion.

The Chamber of Commerce, Kittanning, Pa., is at the head of a project to establish a municipal airport on tract of property recently acquired, to include hangar, machine and repair shop and other mechanical airfield facilities.

The Chaplin-Fulton Mfg. Co., 36 Penn Avenue, Pittsburgh, manufacturer of brass, bronze and other metal castings, will soon take bids for a proposed three-story addition on site, 30 x 100 ft., on Penn Avenue, near Bell Way, recently acquired, reported to cost in excess of $75,000 with equipment. Bernard H. Prack, Martin Building, is engineer.

The Guyan Machine Shops, Logan, W. Va., machinery dealer, has inquiries out for a punch and slitting shear, capable of handling ½-in. plate stock; also for a wheel press, about 200 tons capacity; for several I-beam hoists, electric-operated, a.c. or d.c., about one and two tons capacity; for a japanning oven, either electric or natural gas-operated, of sufficient size for handling large armatures; for a lifting magnet to operate with 220-volt, d.c. service; and for a number of industrial motors, 20, 15 and 10 hp., with starting equipment and accessories.

Officials of the Westinghouse Air Brake Co., Wilmerding, Pa., have organized a new subsidiary under Delaware laws, to be known as the Westinghouse International Brake & Signal Corporation, capitalized at 1,000,000 shares of stock, no par value, to take over and expand the foreign interests and facilities of the parent company in England, France, New South Wales, Italy and Canada, carrying out a general plan of consolidation.

The Brilliant Glass Products Co., Brilliant, Ohio, manufacturer of automobile headlights, signal and marine lights,

etc., is perfecting plans for the early erection of the first unit of a new plant at Edmiston, near Weston, W. Va., to be one story, 80 x 150 ft., reported to cost about $65,000.

E. H. Morford & Co., Citizens' National Bank Building, Charleston, W. Va., machinery dealer, has inquiries out for a standard gage locomotive, Mogul type, 90 to 120 tons capacity; also for a standard railroad track scale.

H. O. Swoboda, Inc., 3400 Forbes Street, Pittsburgh, has arranged to represent the Hevi Duty Electric Co., Milwaukee, in its line of electric furnaces for industrial, laboratory and other purposes. Engineering advice is a feature of the service.

South Atlantic States

BALTIMORE, Aug. 16.

FOUNDATIONS will soon be laid for the proposed steam-operated electric power plant to be constructed by the Delmarva Power & Electric Co., at Vienna, Md., with main unit, 62 x 135 ft., reported to cost more than $400,000, with equipment. The company is a subsidiary of the Eastern Shore Gas & Electric Co., Salisbury, Md. Day & Zimmermann, Inc., 1600 Walnut Street, Philadelphia, is engineer.

The A. Weiskittel & Son Co., Twelfth and East Lombard Streets, Baltimore, manufacturer of stoves, stove castings, etc., has awarded a general contract to the E. Eyring & Sons Co., 808 South Third Street, for a one-story addition to cost approximately $100,000.

The Eastern Oil Co., Goldsboro, N. C., is planning the early operation of its local plant, comprising the former works of the Merchants' Phosphate & Fertilizer Co., recently acquired. Improvements will be made and expansion carried out for increased production. E. F. C. Metz is local manager.

The Board of Aldermen, Goldsboro, N. C., is asking bids until Aug. 25, for two dual-drive centrifugal pumping units, with complete starting and control equipment, for a proposed new raw-water pumping station for city service. William C. Olsen, Inc., Raleigh, N. C., is engineer.

The Stonega Coke & Coal Co., Minor Building, Big Stone Gap, Va., will make extensions and improvements in its coal properties at Stonega, Derby, Dunbar, Exeter, Arno, Imboden and other points in Virginia, with installation of automatic electric substation equipment, mine fans, haulage locomotives, steel mine cars, and auxiliary equipment.

Joseph L. Pearson, Keysville, Va., has inquiries out for filing equipment for sharpening cotton gin saws and auxiliary apparatus used for such work, and is desirous of getting in touch with manufacturers.

The Board of School Commissioners, Madison and Lafayette Avenues, Baltimore, is asking bids until Aug. 24 for mechanical drawing tables for School No. 1; also for laboratory and other equipment for the new Western high school. Joshua R. Jolly is acting secretary.

The Hardwood Co., Broadway, Va., is considering the early rebuilding of the portion of its planing mill, recently destroyed by fire with loss estimated in excess of $85,000, including machinery.

Thomas C. Thomason, Bainbridge, Ga., is planning the purchase of machinery for the production of cement blocks and affiliated products, for installation in a local plant.

The Board of District Commissioners, Washington, is asking bids until Aug. 25, for a quantity of signal cable for the electrical department; also until Aug. 23, for cast iron pipe and special castings for the water division. Specifications on file at the District Building.

The Pitcairn Aviation Co., Land Title Building, Philadelphia, organized to carry out an air line mail service under Government contract, is said to be planning the establishment of an airport at Spartanburg, S. C., including hangar, repair and reconditioning shops, etc. It is understood that the Bryson-Weber Co., Andrews Law Building, Spartanburg, contractors, will carry out the building program.

The Montgomery Lumber Co., Suffolk, Va., is reported to be planning the rebuilding of the portion of its local mill recently destroyed by fire, with loss estimated in excess of $110,000, including equipment. G. B. Montgomery is president.

The Greenville Tobacco Co., Greenville, N. C., is in the market for a canning machine crimper, steam retorts for canning service, copper-jacketed vats of about 100 gal. capacity each, and tin cans.

The Mutual Mfg. Co., Savannah, Ga., recently organized, has acquired property on Forty-third Street, and plans the establishment of a plant for the manufacture of caskets, etc. Equipment will be installed at an early date. Albert T. Nash, Savannah, is one of the heads of the company.

The Rocona Fertilizer Co., Peoples' Building, Charleston, S. C., recently formed with a capital of $100,000, has acquired property at Five-Mile, near Charleston, formerly used for phosphate production, and plans the establishment of a new mill for the production of commercial fertilizers, with installation of additional equipment. E. S. Nash is president, and Jenkins M. Robertson, secretary and treasurer.

The Hackley-Morrison Co., Inc., 204 Jefferson Street, Richmond, Va., machinery dealer, has inquiries out for a combination punch and shear, punch section to have throat opening of suitable size to accommodate a 24-in. I-beam, and with shear of sufficient capacity to handle angles up to 4 x 6 in.; also for two 25-ton jacks; and for one boiler, about 100 hp. capacity, to operate at 125-lb. working pressure.

The Chamber of Commerce, Wilmington, Del., is at the head of a project to establish a municipal airport, and has secured an option on a suitable site. The project will include hangars, machine and repair shops, reconditioning shops, oil houses and other structures, and is reported to cost close to $500,000. Gerrish Gassaway is manager of the chamber.

Gulf States

BIRMINGHAM, Aug. 15.

THE Florida Citrus Machinery Co., Thirteenth and Cumberland Streets, Tampa, Fla., has been organized to manufacture fruit packing and canning machinery. A plant has been rented and some equipment purchased, but the company will be in the market for some additional machinery in the near future.

Plans have been completed by the City Council, Houston, Tex., for a proposed municipal airport and work will soon begin. It will consist of a group of 12 hangars, two one-story machine and repair shops, oil houses and other buildings, reported to cost in excess of $150,000. Edward Wilkinson, 1020 Courtland Street, is architect.

The Brookhaven Gravel Co., Brookhaven, Miss., has approved plans for the complete electrification of its properties, including sand and gravel pit equipment, and mill. Service will be furnished by the Mississippi Power & Light Co., Jackson, Miss. T. W. Maddox is general manager.

The Florida Power & Light Co., Fort Lauderdale, Fla., plans the installation of an oil unloading and storage plant, with electric-operated pumping station and other mechanical facilities, at the Bay Mabel harbor, reported to cost close to $100,000. Headquarters are at Miami, Fla.

The E-Z Opener Bag Co., Decatur, Ill., is reported to be planning the construction of a new mill in the vicinity of Riverside, near Tuscaloosa, Ala., for the production of kraft papers, consisting of several units, with machine shop, power substation and auxiliary mechanical departments.

The Central Power & Light Co., Frost Building, San Antonio, Tex., contemplates the construction of a new steam-operated electric power plant at Clarendon, Tex., to cost upward of $25,000, with equipment.

Fairbanks, Morse & Co., Inc., 900 South Wabash Avenue, Chicago, manufacturer of Diesel engines, pumps, scales, etc., has completed plans for a new two-story branch plant in the Smith Park district, Birmingham, reported to cost in excess of $50,000, with equipment.

The Corpus Christi Oldsmobile Co., Corpus Christi, Tex., has preliminary plans for a new two-story service, repair and garage building, 50 x 150 ft., on Chaparral Street, reported to cost close to $75,000, with equipment. A machine shop will be provided. F. W. Barnholdt is general manager.

The Board of City Commissioners, Jackson, Miss., is planning a bond issue of $50,000, the fund to be used for the establishment of a municipal airport, including hangars, machine repair and reconditioning shops, and miscellaneous structures.

The Aetna Iron & Steel Co., Jacksonville, Fla., has inquiries out for a motor-driven bending roll, with capacity of handling forty-eight-inch plate up to ½-in. thick.

The Murray Co., 3200 Williams Street, Dallas, Tex., manufacturer of cotton ginning machinery, is reported to be considering an expansion program to provide for large increase in present output, with approximately $100,000 to be devoted to the extensions. Work is scheduled to begin early in 1928.

The Board of Education, Brownsville, Tex., plans the installation of manual training equipment in a proposed new two-story high school, estimated to cost $300,000 for which bids will soon be asked on general contract. Phelps & DeWees, Gunter Building, San Antonio, Tex., are architects.

The General American Tank Car & Storage Co., Union Indemnity Building, New Orleans, La., is reported to have plans for extensions and betterments in its storage and distributing plant at Good Hope, La., to cost in excess of $100,000, with equipment. The capacity of the barreling division will be doubled, with installation of new equipment.

R. E. Boggs, Age-Herald Building, Birmingham, machinery dealer, has inquiries out for an electric traveling crane, 55 to 80 ft. span, with capacity for handling a 2-yd. clamshell bucket.

The Jefferson County Board of Education, Birmingham, will soon begin the erection of a new junior high school with manual training department for negro students. Denham, Van Keuren & Denham, Birmingham, are architects.

The New Process Carbon Black Co., First National Bank Building, Houston, Tex., C. A. Barbour, president, recently formed with a capital of $1,500,000, is said to be planning the construction of a plant in the vicinity of Monroe, La., for the production of carbon black under a new process. It is purposed to have the first unit ready for service in November, with estimated cost stated in excess of $150,000, with machinery, compressors, etc.

The City Commission, Devine, Tex., will soon be in the market for a 50,000-gal. elevated steel tank on tower, for the municipal water system.

The S. B. Adams Lumber Co., Conception Street, Mobile, Ala., is said to have plans for the immediate erection of a new one-story mill for the production of hardwood flooring, to cost in excess of $40,000, with equipment.

The Board of Trustees, Texas Technological College, Lubbock, Tex., has plans under way for a new mechanical engineering building at the institution, to cost about $225,000, with equipment. W. C. Hendrick, First National Bank Building, Fort Worth, Tex., is architect.

The Richardson Co., 111 West Washington Street, Chicago, manufacturer of roofing, is said to be planning the establishment of a new factory branch and distributing and storage plant at Jacksonville, Fla., occupying property under lease.

Chicago

CHICAGO, Aug. 16.

INDUSTRIAL buying of machine tools is showing slightly more strength. Standard equipment is slow, but inquiries for and sales of special tools have helped round out buying. The used tool market likewise shows more activity. Sales and inquiries in general during the week give promise that August business may surpass that of last month. The Chicago, St. Paul, Minneapolis & Omaha Railroad has closed on practically all of its outstanding list. This road has bought a hydraulic bushing press, a 28-in. drill, a 32-in. shaper, a bar shear and a few other items during the week. The Chicago, Milwaukee & St. Paul is inquiring for a 4-ft. radial drill, a 20-in. shaper and some special tools for its rail reclamation plant at Tomah, Wis. The Rock Island is expected to close shortly on the remainder of its list, including a shaper, two bolt-cutting machines, several lathes and a drill press. The Burlington inquiry of a half dozen items probably will be closed shortly. A fabricator at Wichita, Kan., purchased four milling machines, and a manufacturer in southern Wisconsin bought a horizontal boring drill. A Chicago and a St. Louis manufacturer each purchased a 5-in. lathe.

The Morrison Implement Co., Morrison, Ill., manufacturer of agricultural implements, etc., has awarded a general contract to A. W. Badger, Morrison, for a new one-story plant, reported to cost in excess of $25,000 with equipment.

The Chicago-Wilcox Mfg. Co., East Seventy-seventh Street and Anthony Avenue, Chicago, manufacturer of gaskets and kindred products, has asked bids on general contract for a new one-story addition to cost about $15,000.

The Central Illinois Public Service Co., Springfield, Ill., is disposing of a bond issue of $4,642,000, a portion of the proceeds to be used for expansion and improvements in power plants and system. Marshall E. Sampsell is president.

The Board of Trustees, University of Illinois, Urbana, will soon take bids on general contract for a new two- and three-story material and equipment testing laboratory building, estimated to cost in excess of $400,000 with machinery. James M. White, Administration Building, is architect and engineer.

The Northern States Power Co., 15 South Fifth Street, Minneapolis, Minn., will soon begin superstructure for its proposed hydroelectric power plant on the Chippewa River, near Chippewa Falls, Wis., with initial installation to consist of six generating units, each with rating of 4000 hp., and auxiliary equipment. The project will include a transmission line and is estimated to cost close to $3,000,000. Robert F. Pack is vice-president and general manager.

The Russell Grader Mfg. Co., 2037 University Avenue, S. E., Minneapolis, Minn., manufacturer of road building machinery, etc., has asked bids on general contract for a new one-story addition on University Avenue, near Twenty-first Street, reported to cost about $45,000. Sund & Dunham, Essex Building, are architects. E. E. Ellertson is president.

The Milwaukee Corrugating Co., 4650 West Harrison Street, Chicago, manufacturer of corrugated metal products, has acquired a three-story building, 90 x 200 ft., at Western Avenue and Forty-third Street, on site, 114 x 449 ft., heretofore held and occupied by the Perfection Stove Co. The new owner will take early possession and will use for a new factory branch, storage and distributing plant. Headquarters is at Thirty-sixth Avenue and Burnham Street, Milwaukee.

The City Council, Littleton, Colo., plans the installation of a pumping plant and other power equipment in connection with extensions and improvements in the municipal waterworks. Burton Lowther, Guardian Trust Building, Denver, Colo., is consulting engineer.

The Iowa Electric Co., Cedar Rapids, Iowa., is planning extensions and improvements in its artificial gas generating plant at Atlantic, Iowa, with installation of additional equipment, reported to cost about $75,000. John Drabelle is chief mechanical engineer.

The Water Board, St. Paul, Minn., J. W. Kelsey, superintendent, will soon take bids for an elevated steel tank with capacity of 200,000 gal., mounted on a 110-ft. tower, for water service in the Highland Park section. F. X. Tewes, City Hall, is city architect.

The State Board of Education, Des Moines, Iowa, is having plans drawn for a new central steam power plant for institutional buildings at Iowa City, estimated to cost about $150,000 with equipment. Bids will soon be asked. Proudfoot, Bird & Souers, Hubbell Building, Des Moines, are architects.

The Universal Crusher Co., 625 Avenue C, West, Cedar Rapids, Iowa, manufacturer of crushers, pulverizers, screens, etc., has plans nearing completion for a new one-story addition, 40 x 100 ft., for which superstructure will soon begin. Norman Hatton, O. R. C. Building, Cedar Rapids, is architect.

The Western Pipe & Steel Co., 4948 Bloomingdale Avenue, Chicago, is said to be considering the erection of a new plant at Vermont Street and Ogden Avenue, Blue Island, Ill., reported to cost close to $40,000.

The Citizens' Gas & Electric Co., Council Bluffs, Iowa, plans extensions and improvements in its local central power substation with installation of additional equipment, estimated to cost close to $175,000. H. J. Butler is general manager.

Cleveland

CLEVELAND, Aug. 16.

THE Great Western Oil Co., 2846 East Thirty-seventh Street, Cleveland, has plans maturing for a one and two-story oil storage and distributing plant, 60 x 180 ft., and 25 x 40 ft., with boiler house, 22 x 35 ft., on East Thirty-seventh Street, reported to cost approximately $100,000, with equipment. F. F. Hodges, Hickox Building, is architect. B. W. Browne is president.

The Star Foundry Co., Troy, Ohio, manufacturer of gray iron castings, will soon take bids for a one-story foundry addition on West Main Street, reported to cost close to $25,000, with equipment.

The Goodyear Tire & Rubber Co., Akron, Ohio, is said to be planning the rebuilding of the tipple at its coal-mining properties at Adena, near Stuebenville, Ohio, destroyed by fire, Aug. 1, with loss estimated at close to $50,000, including equipment.

The Packard Electric Co., Dana Avenue, Warren, Ohio, manufacturer of transformers and other electrical equipment, is disposing of a common stock issue to total $198,000, a portion of the proceeds to be used for expansion. N. A. Wolcott is president.

The Lancaster Tire & Rubber Co., Lancaster, Ohio, is having plans drawn for a one-story and basement addition, 50 x 80 ft., estimated to cost close to $50,000, with equipment. It is understood that the extension will be equipped primarily for the production of solid rubber specialties.

Fire, Aug. 8, destroyed a portion of the plant of the Sandusky Boat & Cabinet Works, Sandusky, Ohio, with loss reported in excess of $30,000, with equipment. It is planned to rebuild. August Reinke heads the company.

The Pennsylvania-Ohio Power & Light Co., Youngstown, Ohio, is considering an expansion and improvement program in plants and system in this section to cost about $5,000,000.

The Whitacre Boiler Co., Wellsville, Ohio, has been incorporated to manufacture water tube gas boilers for hot water, steam and vapor; domestic hot water heaters, direct and indirect; distilled water stills; battery steamers, and kindred products. No additional materials or equipment will be needed.

Cincinnati

CINCINNATI, Aug. 15.

MACHINE tool buying the first half of August was in small volume, and a number of manufacturers report that sales were less than in July. The amount of inquiries now pending is encouraging, although users are expected to be slow in closing for equipment until the vacation season is ended. Automobile makers have been purchasing only a few tools. The Ford Motor Co. recently bought 30 spoke welding machines, the value of this order being approximately $90,000. Ford also has contracted for a number of special milling machines. It is estimated that this company has expended about $150,000 for new tools in the past two months. A local builder has sold seven radial drills to one company, while another machine tool manufacturer has received orders for a 30-in. x 20-ft. engine lathe and a 26-in. x 16-ft. engine lathe, both of which are to be shipped into Eastern territory. The Grand Trunk Railroad, Detroit, has an inquiry out for three engine lathes, and the Commonwealth of Australia is to purchase two large engine lathes. The Erie Railroad has contracted for a No. 4 carwheel lathe and the Erie Forge Co., Erie, Pa., for a 60-in. x 20-ft. planer.

The H. E. Shelton Machinery Co., Inc., 207 South Third Street, Paducah, Ky., has been organized to act as a selling agent for machinery and equipment manufacturers, and will buy, rebuild and sell used equipment. At a later date the company expects to manufacture special machinery, and would like to receive catalogs of machine tools, power plant equipment, contractors' equipment, etc.

The Pennant Tool & Engineering Co., 410 East Street, Springfield, Ohio, is now being operated by R. C. Wysong and J. J. Zeller, who recently assumed control. The manufacture of special machines, tools and dies will continue to be the company's activities.

The Herron Stove & Foundry Co., Chattanooga, Tenn., recently organized and capitalized at $150,000, plans to take over immediately the former plant of the Southern Foundry & Machine Co., and will begin the manufacture of stove castings and light gray iron castings. Frank Herron is president and Bert Adams, vice-president.

The Miami Iron & Steel Co., 916 East Third Street, Dayton, Ohio, has plans for the construction of a one-story warehouse, 125 x 300 ft., at First, Findley and Irwin Streets. The structure will be used for the storage of steel bars and also will house the company's offices.

The Kelly-Kott Mfg. Co., Covington, Ky., manufacturer of X-ray machines, has increased its capital stock from $250,000 to $500,000.

Plans have been filed by the Cincinnati Street Railway Co., Cincinnati, for a one-story car repair plant at Mitchell Avenue and the line of the Baltimore & Ohio Railroad, reported to cost in excess of $265,000 with equipment.

The Board of Education, Ludlow Building, Dayton, Ohio, is said to be planning the installation of manual training equipment in its proposed three-story junior high school at Mount Vernon and Wabash Avenues, for which superstructure will soon begin. It will cost close to $600,000. Bruce Lloyd, Lowe Building, is architect; William B. Ittner, Board of Education, St. Louis, is consulting architect.

The Hoadley Cut Stone Co., Columbus, Ohio, recently organized, will establish a new plant at 1385 North Norton Avenue, where site has been secured. It will be one story, estimated to cost close to $25,000. The plant will be equipped for the fabrication of Indiana limestone, production of cut stone products, etc. E. E. Hoadley is president and general manager.

The Kentucky Utilities Co., Starks Building, Louisville, is said to be arranging an expansion and improvement program for its electric properties to cost close to $500,000, including increase in generating facilities and construction of new transmission lines. Plans are under way for a new steel tower high tension line from Earlington to Morganfield, Ky., about 38 miles.

The Board of Education, Nashville, Tenn., is said to be planning the installation of manual training equipment in its proposed two-story junior high school on Jones Avenue, estimated to cost $200,000, for which bids will soon be asked on general contract. George Waller, Independent Life Building, is architect.

The Fairfield Paper Box Co., Baltimore, Ohio, is completing plans for a new two-story mill at Chillicothe, Ohio, for the production of raw materials, including strawboard, boxboard, etc., estimated to cost $150,000 with machinery.

C. T. Jones, James Building, Chattanooga, Tenn., architect, has plans under way for a new automobile service, repair and garage building, 50 x 100 ft., on local site, estimated to cost about $125,000 with equipment.

Detroit

DETROIT, Aug. 16.

PLANS are being perfected by the Kelsey-Hayes Wheel Co., 3600 Military Avenue, Detroit, for the resumption of operations at its plant at Jackson, Mich., comprising the former plant of the Hayes division of the consolidated company, running on a curtailed basis for some time past. It is purposed to make enlargements in different departments and install additional equipment for the manufacture of steel rims for wire automobile wheels, which branch of production will be concentrated largely at this works. George Kennedy is president.

The Pontiac Pattern & Engineering Co., South Sanford Street, Pontiac, Mich., has awarded a general contract to M. B. Hungerford, 24 West Huron Street, for a new one-story addition to cost close to $30,000 with equipment. R. C. Derrick, Inc., Pontiac Commercial and Savings Bank Building, is architect.

The Buick Motor Co., Flint, Mich., has begun the erection of a new four-story research and experimental laboratory, 100 x 210 ft., reported to cost close to $500,000 with equipment. The first floor will be provided with machinery and apparatus for testing chassis, etc., with a refrigerating department for carburetion research, etc.; the second and third floors will be equipped as machine shops and assembling departments for testing, research and precision experiments; the top floor will be used for engineering and drafting rooms, offices, etc.

The Board of Education, Flint, Mich., plans the installation of manual training equipment in a proposed three-story junior high school at Chevrolet Avenue and Makin Road, to be known as the Longfellow junior high school, estimated to cost $750,000, for which superstructure will soon begin. Malcolmson & Higginbotham, F. P. Smith Building, Flint, are architects.

The Yader Bridge Works, Inc., Port Huron, Mich., operating a general structural steel and iron works, is considering the rebuilding of the portion of its plant destroyed by fire, Aug. 3, with loss reported in excess of $400,000, including equipment and stock. Frank Yader is head.

The Kersten Radio Equipment Co., Kalamazoo, Mich., manufacturer of radio horns, etc., is reported considering a new local plant for considerable increase in present output, work to begin in the fall. It is reported to cost in excess of $75,000. The company has recently advanced its production schedule from 450 to 800 horn units per day. J. Kersten is president.

The receivers for the Rickenbacker Motor Co., 4815 Cabot Street, Detroit, have secured permission from the United States District Court to dispose of the personal property of the company involved in the receivership, and to negotiate for bids on the two local plant units of the company on Twelfth Street and on Federal Street, respectively. It is purposed to hold a public auction of the plants and personal property before the close of September. Present personal property of the company is valued in excess of $2,000,000. The Security Trust Co., and B. F. Everitt are receivers.

The Brunswick-Balke-Collender Co., 629 South Wabash Avenue, Chicago, manufacturer of talking machines and parts, billiard tables, etc., is arranging for expansion at its plant at Muskegon, Mich., and will establish a new division to give employment to about 300 men. Equipment and facilities will be provided at an early date.

The Board of Education, Birmingham, Mich., contemplates the installation of manual training equipment in a proposed new high and grade school, estimated to cost $250,000, for which bids will be asked on general contract at an early date. Fred D. Madison, Royal Oak, Mich., is architect.

The Production Machinery Sales Co., Detroit, has moved to 4845 St. Aubin Avenue, a location that is closer to the main industries of that city. The company is interested in obtaining a few more agencies for machine tools. Among its recent sales are the following: 16 motor-driven engine lathes for a school, three tool room lathes, a 14-in. x 10-ft. lathe, two belt-driven shapers, a 3-ft. radial drill, a bench precision lathe, three 20-in. motor-driven drilling machines.

The Johnson Mfg. Co., Detroit, has been organized to succeed the Johnson-Murphy Co., and will manufacture gas lighters for water heaters. No additional materials or equipment will be needed.

Milwaukee

MILWAUKEE, Aug. 15.

BUSINESS in machine tools is devoid of interest or feature. Inquiry is moderate, but prospective buyers are proceeding slowly in making purchases. In the main, existing equipment appears generally to be adequate to handle current orders and there is no disposition to go farther than to make the most necessary replacements. Industrial construction is at low ebb, but a number of projects are under consideration during the coming winter. Sentiment relative to future business in the foundry and machine shop industry is becoming more cheerful.

The Green Bay & Mississippi Canal Co., Kaukauna, Wis., contemplates the construction of a new hydroelectric generating plant and is having preliminary plans and estimates prepared by Orbison & Orbison, consulting engineers, Appleton, Wis. The investment is expected to be in the neighborhood of $100,000.

The Allen-Bradley Co., 286 Greenfield Avenue, Milwaukee, manufacturer of electric controlling devices, closes bids Aug. 19 on the construction of additions to its shops which will cost about $150,000. The architect is Fitzhugh Scott, 214 Mason Street. Harry L. Bradley is general manager.

The Bay City Dredge Works, Bay City, Mich., is lowest bidder for furnishing the Milwaukee Department of Public Works one truck-mounted crane at $3,225, with an alternate bid of $3,450.

The Common Council of Fond du Lac, Wis., has accepted the following bids for construction and equipment of its new municipal sewage disposal plant: Building, Immel Construction Co., $107,843; cast iron pipe, United States Cast Iron Pipe & Foundry Co., $7,997.50; Venturi meter, Simplex Meter Co., Philadelphia, $1,600; pumps and motors, Fairbanks, Morse & Co., Chicago, $12,500.

The Appleton Wire Works, Appleton, Wis., has placed the contract for plant additions estimated to cost $35,000 with Gruenke Brothers.

The Common Council of Menasha, Wis., has accepted the bid of the Norwood Engineering Co., Florence, Mass., to furnish and install the complete machinery and equipment of the new municipal filtration plant at $46,750. The plant as a whole will cost about $125,000.

The Board of Education, South Milwaukee, Wis., is selecting an architect to design a proposed new junior high and vocational training school, for the construction and equipment of which the Common Council has appropriated $200,000. Work will be carried on during the winter. H. Daehling is secretary of the board.

The Moloch Foundry & Machine Co., Kaukauna, Wis., manufacturer of automatic stoking devices, power hammers, etc., is completing a new foundry building, 75 x 150 ft., one story, estimated to cost $40,000. It replaces the casting shop badly damaged by fire three months ago. R. M. Kanik is general manager.

St. Louis

ST. LOUIS, Aug. 16,

OVENS, power equipment, conveying machinery and other mechanical equipment will be installed in the five-story, basement and sub-basement factory, 175 x 176 ft., to be constructed by the National Candy Co., 208 North Broadway, St. Louis, at Bingham and Gravois Streets, estimated to cost $1,000,000 with machinery. Klipstein and Rathman, 316 North Eighth Street, are architects. A. J. Walter is vice-president.

The Central Power Co., Grand Island, Neb., has secured permission to issue bonds for $3,377,000, preferred stock for $300,000, and common stock in amount of $665,100, a portion of the proceeds to be used for expansion in power plants and system, including the acquisition of additional properties.

The Emerson Electric Mfg. Co., 2018 Washington Avenue, St. Louis, manufacturer of motors, fans, etc., has purchased a five-story building at Twenty-first Street and Lucas Avenue, totaling about 85,000 sq. ft. of floor space, and will occupy for a new branch factory, to be equipped primarliy for the production of motors for electric fans.

The Union Tank Line, Neodesha, Kan., tank cars, has awarded a general contract to the Hughes-Foulkrod Co., 1505 Race Street, Philadelphia, for a new one-story car shop, estimated to cost $55,000 with equipment. A. M. Burton is company architect and engineer.

The Holcomb Foundry & Machine Works, Poplar Bluff, Mo., will soon begin superstructure for a two-story foundry and machine shop, 60 x 80 ft., with one-story addition, 30 x 40 ft., reported to cost close to $50,000 with equipment. General contract recently was let to the Monolith Builders Co., Kansas City, Mo.

Officials of the Oklahoma Portland Cement Co., Oklahoma City, Okla., have organized a new company, to be known as the Arkansas Portland Cement Co., to construct and operate a new cement mill at White Cliffs, Ark., consisting of several units, equipped for a capacity of 2500 bbl. per day, reported to cost close to $2,000,000 with machinery. The new mill will operate under the wet process. Headquarters will soon be established at Little Rock, Ark. Charles Boettcher Co., Denver Colo., is president. C. D. Nichols, vice-president of the Oklahoma Portland Cement Co., will act in like capacity for the new organization.

C. L. Thompson, Home Insurance Building, Little Rock, Ark., architect, will soon take bids on revised plans for a proposed one-story and basement automobile service, repair and garage building at El Dorado, Ark., estimated to cost $135,000 with equipment.

The City Council, Macon, Mo., will soon take bids for pumping machinery and auxiliary equipment for the municipal waterworks. The entire project will cost $165,000. The Burns & McDonnell Engineering Co., Interstate Building, St. Louis, is engineer.

The Oklahoma Natural Gas Corporation, 117 West Fourth Street, Tulsa, Okla., is considering plans for the construction of a 16-in. pipe line from its compressor station at Norge to the South Canadian River section. It is purposed to begin work in September. A 22-in. pipe line from the same station to the Texas Panhandle district also is proposed. The entire project will cost in excess of $450,000. R. C. Sharp is president.

The Chamber of Commerce, Texarkana, Ark., is at the head of a project to establish a new municipal airport at Spring Lake Park, where site has been selected, to consist of hangars, machine and repair shop, oil houses and other buildings, to cost about $50,000. An airport committee has been appointed by the Chamber to carry out the enterprise.

Indiana

INDIANAPOLIS, Aug. 16.

THE Ames Shovel & Tool Co., Anderson, Ind., is having plans drawn for a three-story addition, 40 x 80 ft., to be equipped primarily as an extension to the pickling department, reported to cost in excess of $50,000. E. F. Miller, Farmers' Trust Building, is architect.

The Ligonier Refrigerator Co., Ligonier, Ind., has awarded a general contract to W. R. Dunkin & Son, Huntington, Ind., for a proposed new three-story and basement plant, 50 x 95 ft., to cost approximately $100,000, with equipment. A. M. Strauss, Cal-Wayne Building, Fort Wayne, Ind., is architect.

The Board of Education, Madison, Ind., plans the installation of manual training equipment in a new three-story high school on High Street, estimated to cost about $180,000, for which bids will be asked on general contract early in September. Henkel & Hanson, Heinemzn Building, Connersville, Ind., are architects.

The Maring Wire Co., Muskegon, Mich., has filed plans for the erection of the initial unit of a new plant at Anderson, Ind., to cost about $45,000, with equipment. It is proposed to build additional units at a later date. The company specializes in the production of magnet wire and kindred wire goods.

The Board of Education, Oakland City, Ind., is said to be planning the installation of manual training equipment in a new two-story and basement high school, estimated to cost $175,000, for which superstructure will soon begin.

The Auburn Automobile Co., Auburn, Ind., has awarded a general contract to J. R. Muhn, Auburn, for a two-story addition to cost approximately $150,000, with equipment. J. I. Farley is president.

The Cleveland, Cincinnati, Chicago & St. Louis Railroad Co., Big Four Building, Cincinnati, has awarded a general contract to the Ellington Miller Co., 417 South Dearborn Street, Chicago, for its proposed engine house and locomotive repair shops at South Anderson, Ind., to cost approximately $200,000, with equipment. H. A. Baldwin is chief engineer.

The J. R. Grantham Motor Sales Co., 541 Washington Street, Gary, Ind., will soon take bids on general contract for a three-story service, repair and garage building, with sales quarters at Thirty-sixth Street and Broadway, esti-

mated to cost approximately $100,000, with equipment. Joseph H. Wildermuth, 538 Broadway, is architect.

The Board of School Commissioners, Attica, Ind., is considering the installation of manual training equipment in a proposed new two-story high school, reported to cost $185,000, for which foundations will soon be laid.

The Fisher Brothers Oil Co., Evansville, Ind., is completing plans for a new one-story oil storage and distributing plant on Illinois Street, near Sherman Street, to cost about $45,000, with equipment. Frank Fisher is general manager.

The H. & P. Electric Co., Bloomington, Ind., has plans in progress for a two-story and basement service, repair and operating building, 45 x 105 ft., to cost about $55,000, with equipment. Harry E. Boyle & Co., Furniture Building, Evansvile, Ind., are architects.

The Gauntt Shift-O-Lites Co., 4220 Fairfield Avenue, Fort Wayne, Ind., has been organized to manufacture lighting equipment. The company is not in the market for machinery or materials. Contract for the manufacture of its product has been let to the Bailey Mfg. Co., Union City, Ind.

Pacific Coast

SAN FRANCISCO, Aug. 12.

CONTRACT has been let by the Chevrolet Motor Co., Oakland, Cal., to the Dinwiddie Construction Co., Crocker Building, San Francisco, for proposed one-story additions to its local assembling plant on the Foothill Boulevard, reported to cost in excess of $100,000 with equipment. The company is a subsidiary of the General Motors Corporation, Detroit, with main plant at Flint, Mich.

The Southern California Edison Co., Los Angeles, has filed plans for the construction of a steam-operated electric generating plant at Terminal Island, Long Beach, Cal., with main unit, 185 x 235 ft., and one- and two-story buildings adjoining, including two-story control house, 59 x 85 ft., estimated to cost $850,000 with equipment. The Stone & Webster Engineering Co., Laughlin Building, Los Angeles, is engineer. The company is arranging for the sale of a bond issue of $35,000,000 in September, a portion of the proceeds to be used for extensions and improvements in power plants and transmission system.

The Firestone Tire & Rubber Co., Akron, Ohio, has plans in progress for its proposed new plant in the South Gate district, Los Angeles, where 45 acres of land recently was acquired, and will break ground for the initial units early in October. The first buildings will approximate 10 acres of floor space, multi-story type, and will be equipped for a daily output of 5000 tires and 7000 inner tubes. The plant will give employment to more than 2000 men, and is estimated to cost about $5,000,000 with machinery.

The Beacon Airways, Inc., Fresno, Cal., recently organized, is planning the construction of hangars, repair shop, oil house and other buildings for airport service. The company is headed by Franklin W. Hemingway and Presto Stephenson; it is represented by B. W. Gearhart, Griffith-McKenzie Building, attorney.

The Vermont Marble Co., 244 Brannan Street, San Francisco, has plans nearing completion for a proposed one-story plant on Third Street, for polishing, finishing and other mechanical work, reported to cost close to $50,000 with equipment. E. C. Porter is manager.

W. L. Eaton, Seattle, has completed plans for a two-story automobile service, repair and garage building, 80 x 130 ft., at 1100-24 East Pine Street, estimated to cost $130,000 with equipment. The Austin Co., Dexter-Horton Building, is architect.

The United States Bureau of Reclamation, Wilda Building, Denver, Colo., has tentative plans under way for a new hydroelectric generating plant at American Falls, Idaho, for which an appropriation of $700,000 has been made by Congress. Raymond F. Walter is chief engineer.

The Western Pine Mfg. Co., Spokane, Wash., is considering the rebuilding of the portion of its plant destroyed by fire, July 31, with loss estimated at $70,000.

Richard D. King, Van Nuys Bldg., Los Angeles, architect, has completed plans for a new six-story and basement automobile service, repair and garage building at Eighth Street and Normandie Avenue, reported to cost in excess of $200,000 with equipment.

The Ingersoll-Rand Co., Higgins Building, Los Angeles, manufacturer of rock drills, mining machinery, etc., with headquarters at 11 Broadway, New York, has awarded a general contract to the Bavin-Burch Co., 173 East Jefferson Street, for a two-story factory branch, storage and distributing plant at 1460 East Fourth Street, estimated to cost about $65,000.

The Bureau of Water and Power, 207 South Broadway, Los Angeles, has approved plans for a new hydroelectric generating plant at the Haiwaee reservoir, Inyo County, with capacity of 8000 hp., making the third such municipal station of the city, and will proceed with work at once.

Foreign

THE Anaconda Copper Mining Co., 25 Broadway, New York, has authorized the construction of new plants for zinc production at Kattowitz, Poland; Oda, Norway; and at Crotone, Italy, reported to cost more than $1,000,000. Floyd Weimar, engineer for the company at its Great Falls, Mont., plant for a number of years past, has been assigned to superintend the erection of the plants, estimated to require about 24 months for completion.

The Rhine-Westphalia Electric Power Corporation, Essen, Germany, has arranged for a bond issue of $15,000,000, of which about $11,000,000 will be sold in the United States, a portion of the proceeds to be used for extensions and improvements in power plants and transmission system. The company is now operating nine generating stations, with aggregate capacity of 700,000 hp. The National City Co., New York, is handling the issue in this country.

The Department of Public Works, Supplies and Tenders, Wellington, New Zealand, is asking bids until Nov. 15, for an overhead traveling crane, 1-ton capacity, for its Waikarembane power scheme.

The United Steel Works Corporation (Vereinigte Stahlwerke Aktiengesellschaft), Berlin, Germany, is disposing of a bond issue of $4,225,000 in the United States through Dillon, Read & Co., Nassau and Cedar Streets, New York, stocks and bonds, a portion of the fund to be used for expansion and betterments. The company comprises a merger of four prominent iron, steel and coal companies in Germany, including Rheinelbe Union, Thyssen, Phoenix and Rheinstahl. Carl Rabes is managing director.

The Minister of Public Works, Montevideo, Uruguay, is perfecting plans for a proposed hydroelectric power project on the Rio Negro, about 150 miles from Montevideo, with transmission line for service in that city. The entire project is estimated to cost approximately $20,000,000. It is proposed to begin work in 1928, and prior to that time the department will solicit investigations and suggestions from construction companies and others regarding the project, with official tenders to be asked closely following. The American Consulate, Montevideo, C. Carrigan, consul general, has information regarding the enterprise.

The Eastern Bengal Railway, Calcutta, India, is perfecting plans for a construction program over a period of five years, including new lines, rolling stock, shops and shop equipment, and other facilities. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference India No. 54232; also at the American Consulate, Calcutta, Charles E. Spofford, Jr., trade commissioner.

Canada

TORONTO, ONT., Aug. 15.

NOTWITHSTANDING that July and August are considered the quiet months of the year, Canadian dealers state that this year has proved an exception and that machinery and machine tool sales have equalled and in some instances surpassed those of former months. Taken as a whole, the demand for machinery and tools this year has exceeded that of almost any year since 1920, and according to the present outlook sales will continue at a high level. May imports of machine tools and industrial equipment from the United States were valued at close to $4,750,000.

Current demand for machine tools is active and inquiries are more numerous. The Ford Motor Co. of Canada, Ltd., has installed considerable new equipment and tools in its Ford, Ont., and other plants and has also made numerous changes in old equipment in order to adapt the plant for turning out the new Ford cars. General Motors of Canada, Ltd., will also spend large sums on tools and machinery in connection with plant additions now under construction at Oshawa, Ont. For some time past the automotive industry has been the leading purchaser of tools in Canada.

The Eugene F. Phillips Co., Brockville, Ont., will, in addition to the erection of a new wire plant, build two other units to its plant here. A building will be erected, 175 x 175 ft., to be used for winding mill; also one, 75 x 125 ft., for an enameling plant. Building contracts have been let, but equipment will be purchased later.

The L. & N. Co., Ltd., St. Johns, Que., manufacturers of armored steel tape, propose to build a $15,000 factory there.

Plans are nearing completion for a large addition to the plant of the Booth-Coulter Copper & Brass Co., 115 Sumach Street, Toronto. H. G. Salisbury, 17 Bowden Avenue, is architect.

Morrow & Beatty, Ltd., 442½ George Street, Peterborough, Ont., have been awarded contract by Spruce Falls Power & Paper Co., 330 Bay Street, Toronto, Ont., for the construction of a four-machine paper mill at Kapuskasing, Ont. Complete electrical construction including work on hydroelectric generating station at Smooth Rock Falls, was awarded to Canadian Comstock Co., Ltd., 331 Bay Street, Toronto.

The Malcolm Furniture Co., Kincardine, Ont., awarded contract to H. Horne, Sr., Listowel, Ont., for factory addition to cost $16,000. Wood-working tools and machinery will be purchased for new plant.

John MacGregor, Ltd., 121 Bishop Street, Montreal, Que., has been awarded general contract for $12,000 addition to the foundry and machine shop for the Lymburner Brass Works, 5849 Boyer Street, Montreal. Architects are Hutchison & Wood, 86 Notre Dame Street West, Montreal.

N. A. Timmins, Inc., Canada Cement Bldg., Montreal, Que., has awarded contract to John MacGregor, Ltd., 121 Bishop Street, for the erection of a foundry at Montreal to cost $14,000.

Plans have been prepared by J. Claceau, Chicoutimi, Que., for a $40,000 power plant at Riviere a Pierre, Que., in Portneuf County, for La Cie. d'Entreprises Publiques, Ltee., 117 Mountain Hill, Quebec. The power plant will have a capacity of 300 hp., and will include a dam 50 ft. long by 15 ft. high. Equipment will include a water-wheel of 300 hp., one generator of 225 kw., transformer and electric line two miles long of 2200 to 110 volts. C. Camille Lessard, 32 des Allies Boulevard, Quebec, is assistant engineer.

Western Canada

Smith Brothers & Wilson, Ltd., Regina, Sask., have the contract for building $165,000 distributing warehouse at Weyburn, Sask., for the International Harvester Co. of Canada, Ltd. Contract for reinforced and structural steel was let to Dominion Bridge Co., Ltd., 604 Canada Life Building, Winnipeg, Man.

Construction work is under way on a plant at Duncan, B. C., for the X. L. Sand, Gravel & Brick Co., Ltd. Excavations for foundations for heavy machinery are in progress.

NEW TRADE PUBLICATIONS

Sprockets and Chains.—Webster Mfg. Co., Chicago. Catalog 50 of 96 pages covers a wide variety of forms of links made up into continuous chains and of the sprocket wheels over which they run. Price lists cover the various items. Many illustrations show the different patterns, while a few more are of installations.

Motor Bearings and Armatures.—Century Electric Co., 1806 Pine Street, St. Louis. Four-page folder devoted to the bearings and armatures of single-phase motors of the repulsion-start induction type.

Redesign Engineering.—Fusion Welding Corporation, 103rd Street and Torrence Avenue, Chicago. Booklet of 24 pages featuring the salvaging of worn parts by means of fusion welding. Equipment and accessories are illustrated.

Direct-Heating Electric Furnaces.—General Electric Co., Schenectady. Bulletin 37A of four pages illustrated describes three types of electric furnaces for temperatures below 2000 deg. Fahr. These are made in various styles to suit users' requirements.

Excavating Equipment.—Link-Belt Co., Chicago. Bulletin B-10 dealing with the company's crawler excavating and handling equipment. Included are shovels, draglines, trench shovels, grab buckets, wood grapples, skimmer buckets, and kindred equipment. The units are furnished with internal combustion engines or electric motor drives.

Handling Equipment.—Revolvator Co., 336 Garfield Avenue, Jersey City. Section of Bulletin 91E, dealing with the company's combination hand-motor drive Model K portable elevator for all types of hoisting purposes.

Drag Scrapers.—R. H. Beaumont Co., Philadelphia. Catalog 95, devoted to the Beaumont cable drag scraper system for handling sand, gravel, stone and other bulk materials. Units of the system are described in detail, particular attention being given to the driving drums of both band and cone friction types.

Electric Motors.—Wagner Electric Corporation, St. Louis. Bulletins 149 and 150, devoted respectively to the company's single-phase, repulsion induction, type 66 electric motor of 1/6, ¼ or ⅓ hp., and to the larger, type 76, unit of ½, ¾ or 1 hp.

Refrigerator Equipment.—Mueller Brass Co., Port Huron, Mich. Folder, listing and briefly describing the company's brass parts for electric refrigerators. Included are shut-off valves, flared tube fittings, seamless brass and copper tubing, red tip brass rods and brass pipe fittings. Other parts manufactured to order are listed.

Vacuum Heating Pumps.—W. N. Best Corporation, Sixth Avenue and Thirty-first Street, New York. Leaflet 51, dealing with the Ames vacuum heating pump. Specifications and ratings of the various sizes units are given.

Auxiliary Heating Equipment.—Connersville Blower Co., Connersville, Ind. Bulletin 10C, containing a general description, together with tables of capacities, on the company's types H and H-H blowers for capacities of 400 to 2200 cu. ft. per min. and pressures up to 2½ lb. per sq. in.

Air Compressors.—Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin 133, dealing with the company's model 121 portable air compressor. Information regarding its regulation, lubrication, mounting and general uses is included.

Electrical Equipment.—General Electric Co., Schenectady, N. Y. GEA-743, concerned with drum controllers for 2- or 3-phase, slip-ring, induction motors; GEA-780, describing solenoid operated air circuit breakers, both type CP-3 of 100 to 1200 amp. and 650 volts and type CK-3 of 2000 to 6000 amp. and 650 volts; GEA-765, dealing with the company's CR7006-D20 magnetic switch, an across-the-line starter for single- and 3-phase induction motors; GEA-754, devoted to semi-automatic reduced voltage starters for synchronous motors, including both high- and low-voltage units.

Intake Screens.—Link-Belt Co., 910 South Michigan Avenue, Chicago. Bulletin B-3, devoted to "clean water" intake screens for various industrial applications. The bulletin embodies a number of views of representative installations as well as diagrams illustrating the construction and operation of the screens.

Excavating Equipment.—Marion Steam Shovel Co., Marion, Ohio. Bulletins 318, 319 and 320, devoted respectively to the company's straight-gas, gas-electric and steam driven shovels, draglines and cranes. Detailed descriptions and abridged specifications of all models are included.

Hammer Drive Anchors.—Diamond Expansion Bolt Co., Garwood, N. J. Bulletin devoted to a description of hammer drive anchors for use in making fastenings to brick, stone and concrete. The anchors are of zinc and the nails are galvanized a special hot dip process.

Welding and Cutting Equipment.—International Oxygen Co., Newark, N. J. Catalog No. 27 describing "Eyeosee" and "International" welding and cutting equipment, such as oxy-acetylene blowpipes, regulators and supplies, acetylene generators and the gases, oxygen, acetylene, hydrogen and "Eyeosee Primogas."

Conveyors.—Link-Belt Co., 300 West Pershing Road, Chicago, Data Book No. 615 of 148 pages. Details of conveyors and their application to conveying problems form the subject matter of this book, which also contains much valuable engineering data.